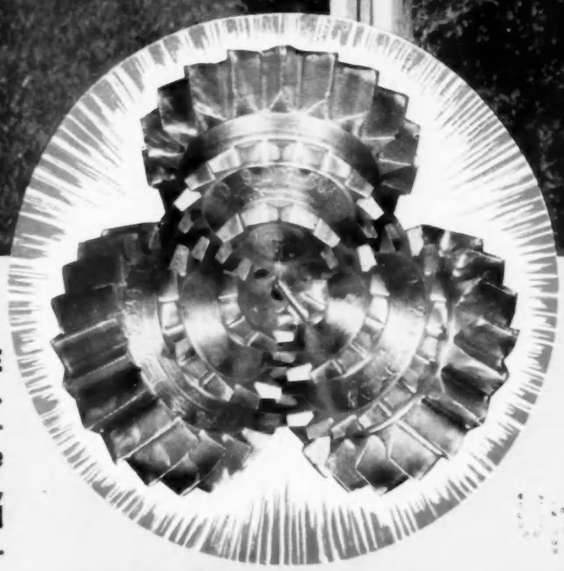

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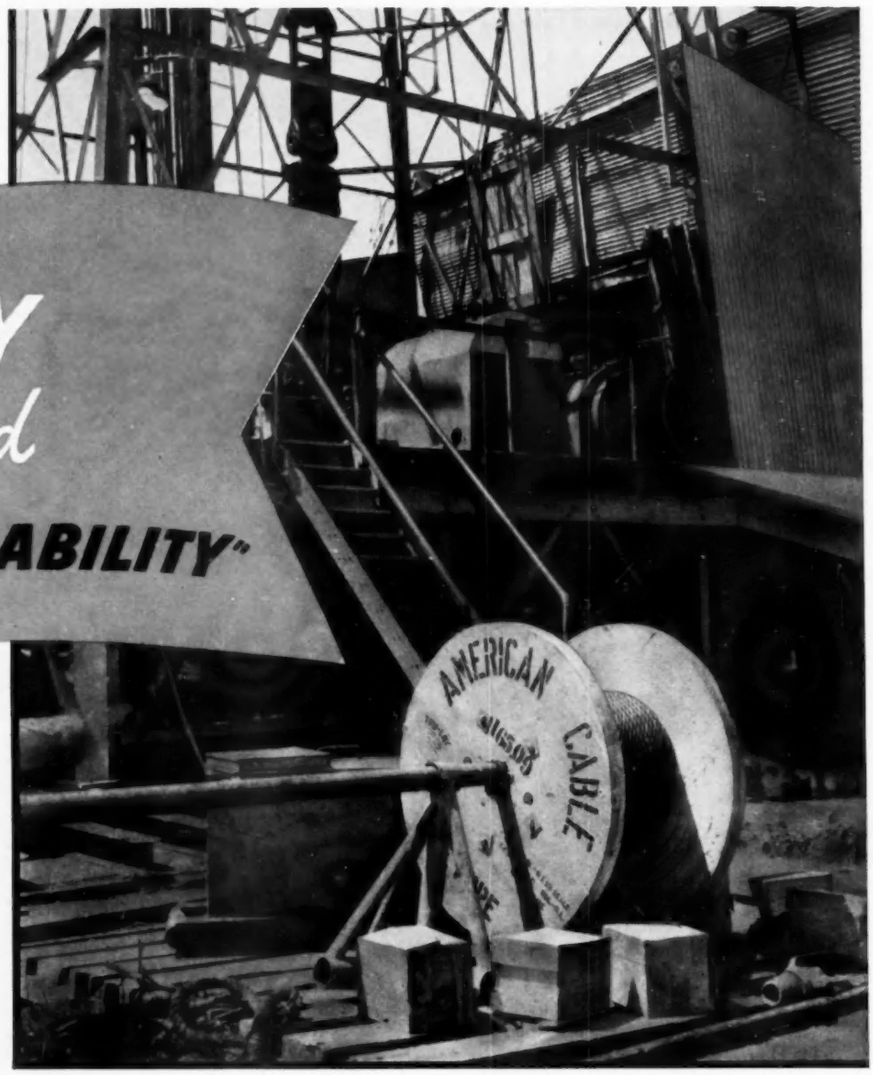

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THE OIL WEEKLY

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The Oil Man's Calendar

JUNE 9–10	Liquefied Petroleum Gas Association, Pacific Coast Section, San Francisco.
16–20	American Society of Mechanical Engineers, Petroleum Division, Kansas City, Mo.
19–20	Pennsylvania Grade Crude Oil Association, Bradford.
19–21	Twentieth Anniversary Celebration, Arkansas Petroleum Industry, El Dorado.
20–21	Kentucky Oil & Gas Association, Mid-Year Meeting, Lexington.
SEPT. 8–12	American Chemical Society, Atlantic City.
17–19	National Petroleum Association, Atlantic City.
NOV. 2–7	American Petroleum Institute, Annual Meeting, San Francisco.

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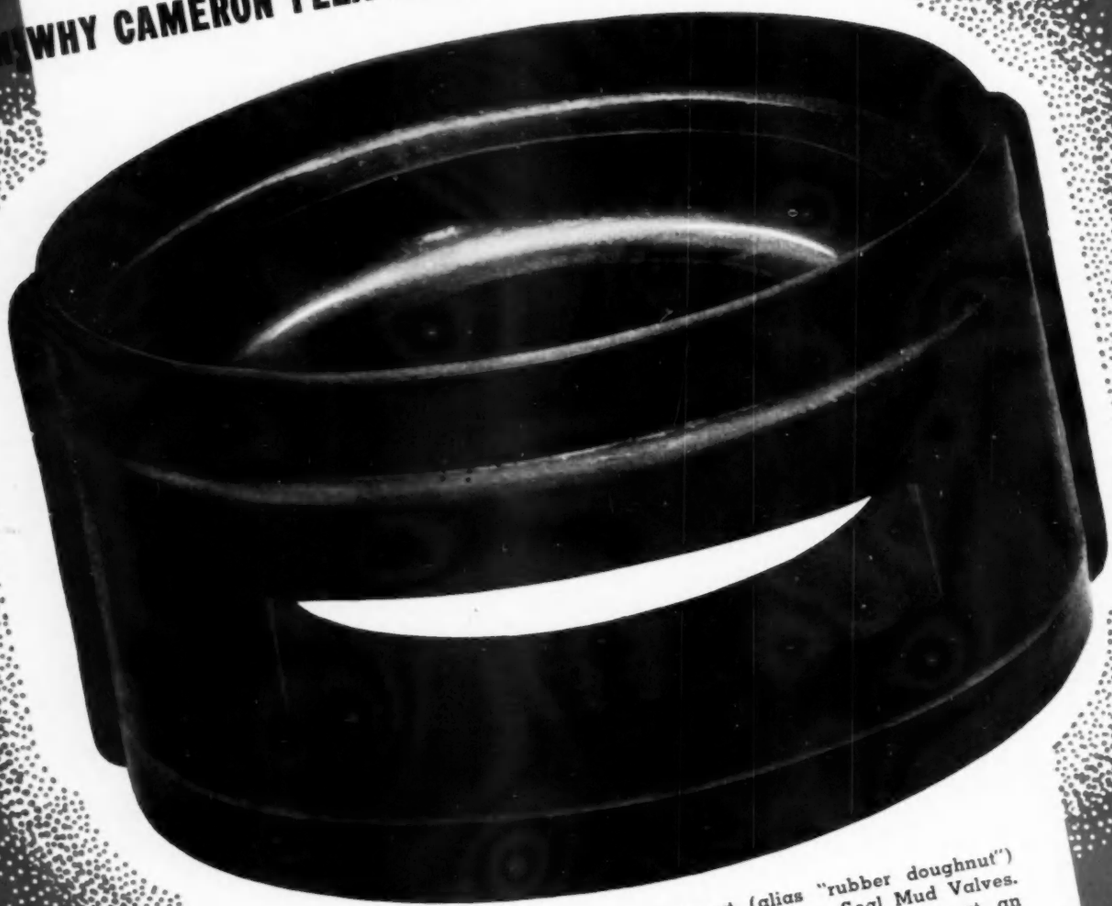

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THE OIL WEEKLY

JUNE 9, 1941

VOLUME 102 NUMBER 1

The Changing Panorama

ABILITY of the oil industry to carry on and render unimpaired service to the country in the face of the proposed reduction of steel available for drilling and pumping equipment, will depend materially upon the intelligence with which the supplies of steel are utilized.

Conversations with oil men indicate that wider spacing, which in turn can mean a larger well allowable, will go a long way toward offsetting a loss in the number of wells likely to be drilled. As a matter of fact, wider spacing represents common sense in a great majority of instances, and close spacing has been the occasion of waste in drilling expenditures and has made proration problems and bottom-hole conditions more acute in the areas where it has been flagrantly in operation.

There is, however, one point which we hope that the petroleum coordinator (who, we understand, will have a great deal to do with the allocation of steel to the oil industry), will bear in mind. A considerable percentage of producing wells completed annually go on the pump within a comparatively short time, some of them immediately. If additional burden should be put on present flowing wells, it is not unreasonable to assume that the period of their flow life will be lessened materially and that many wells which would flow for a longer period otherwise, will go on the pump within a comparatively short time. Naturally, this situation varies with different areas.

There is at this time an impending, though not actual shortage, of certain highly important materials used in the manufacture of pumping units. During the week THE OIL WEEKLY communicated by long distance with a number of the leading manufacturers of pumping units. In all instances it was indicated that while their production is moving along at full pace, they are faced with a shortage of bearings and structural steel particularly. The fear was expressed by most of them that within 30 to 90 days the situation on bearings might become so acute as to substantially slow down their production. Practically the same situation exists, they reported, on structural steel needed in making pumping units.

One manufacturer's executive did not seem particularly concerned over the situation, stating that a manufacturer was trying out wooden bearings and that his company was watching these bearings with a great deal of interest—that such bearings might solve the problem. The other manufacturers made no reference to such a possible substitute but agreed that the total amount of bearings used and the total amount of structural steel used is so small in comparison with the general output of such supplies as to make the oil industry's portion of them exceedingly small. All except one agreed that if special priorities could be had on bearings and structural steel for pumping unit manufacture, the only remaining problem they would face in providing an adequate supply of pumping units would be labor. Most of them seemed to think that they would be able to take care of the labor situation.

There is, as many operators have discovered, a dearth of prime movers to operate pumping units. The manufacturers we talked to, as a general rule, did not manufacture such prime movers but purchased them for installation in connection with their equipment.

All of the manufacturers, with the exception of one, expressed the sentiment that something should be done to insure to the oil industry the comparatively small amount of bearings and structural steel necessary to provide an uninterrupted flow of pumping units to the fields as they are needed to put wells on production.

It would seem that a practical plan to be followed would be for the manufacturers of such equipment in conjunction with the oil companies themselves, to present a memorandum setting forth the facts to Coordinator Ickes in order that he may be advised of this situation in advance.

Washington Becomes Center . .

Appointment of a federal oil coordinator means that there will be many changes in the petroleum industry. For one thing, Washington will become the news center of the industry. Events occurring in Washington will have an important bearing on the operations of the entire industry, and for some time are likely to come with rifle-fire rapidity. The orders coming from Washington will influence the very foundation of the industry's operations—drilling and production, as well as transportation and refining.

Recognizing the importance of the changed conditions that are being created, the editorial staff of THE OIL WEEKLY last week held a three-day conference to study the situation and formulate plans to assure its readers full, prompt analytical coverage of news developments and to keep its subscribers posted on operating changes created by these events.

Gasolineless Sundays . . .

Through some strange error in reporting newspapers of the country on Wednesday carried stories to the effect that representatives of the American Petroleum Institute recommended to Secretary Ickes that if rationing of gasoline became necessary in any one part of the United States, it should be made applicable to all parts, whereas the actual facts in the case were directly contrary to the reports carried in the newspapers.

William R. Boyd, Jr., of the American Petroleum Institute gave out a statement Wednesday afternoon correcting the mistake in re-

porting and indicating that oil men members of the API committee felt that it would not be necessary to have gasolineless Sundays in those portions of the United States where the available supplies of gasoline are plentiful.

The whole situation with reference to gasolineless Sundays is fraught with danger to public morale and with danger to the oil industry. A major mistake easily could mark the beginning of Secretary Ickes' job as petroleum coordinator. Whether or not the mistake will be made remains to be seen.

Newspaper handling of the announcement of Ickes' appointment as administrator in many instances showed an ignorance on the part of the public as displayed in the newspaper stories, as to the general situation. Some newspapers failed to understand that a prospective shortage on the Atlantic seaboard was *not* occasioned by any fault of the oil industry and some seemed to think that the President had stepped in to handle an oil problem which would be too much for the oil industry. Those in the oil industry, of course, know that the facts are that there is no shortage of oil but that there is a shortage of transportation, occasioned by diversion of tankers from coastwise petroleum shipments to go to the aid of England in moving South American oil. Had the oil industry been adequately consulted in advance before being told that the tankers would be requisitioned, they could easily have pictured the results of such tanker diversion.

In considering gasolineless Sundays we believe that the federal government can well bear in mind the effect of such an action on the morale of armament and munition workers as well as the general population in the East. For men and women, who will be required to work longer hours, to discover suddenly before the United States has fired a shot in the present war, that they are being rationed on the one thing which they have been told is plentiful and to be held to their homes on Sunday rather than to take the recreation which is a part of every American worker's life, will not beget the confidence in the efficiency of our government to which these men and women are entitled. On the other hand to think of gasolineless Sundays in those areas not affected by the transportation problem is the height of absurdity. The fact that transportation facilities have been impaired will mean a piling up of stocks in the oil country and in the refineries outside of the Atlantic seaboard. To add to this piling up by requiring gasolineless Sundays in areas where they may not be needed will be only to disrupt further operations of an industry which has already had a severe shock.

Gasolineless Sundays in the areas outside the Atlantic seaboard would be utter folly. We are not yet sure that they are necessary there.

We hope that Mr. Ickes will think well before he takes a step into gasolineless Sundays.

Danger to the water routes from sources of petroleum supply to the Atlantic seaboard plus diversion of tankers have been named as reasons why additional pipe lines should be constructed from the oil fields of the Southwest to the big consuming centers in the East. The Navy naturally isn't keen to have its destroyers tied up in convoy work if German submarines should operate against our coastwise shipping.

We were asked this week if there might be anything to the suggestion that protection of tankers against submarines in the Mississippi River would not be a difficult job and that some of the length of the proposed pipe lines might be reduced and the efficiency of the tanker supply increased if the line or lines were laid from a point near St. Louis eastward, using the Mississippi as a protected waterway for tankers.

Big Line Difficulties . . .

Construction of a 1500-mile 24-inch crude carrier to the Atlantic Coast would encounter many mechanical difficulties in the opinion of many engineers.

If steel-mill capacity is available, the single-barrel 24-inch line could be built in from 9 to 15 months, but the steel industry lacks pipe mill capacity to turn out the 500,000 tons of steel required if the pipe should have a wall thickness of only one half inch. To provide sufficient strength for a 24-inch pipe to be operated under pressures considered standard in crude-oil transportation, the pipe walls would have to be nearly twice that thickness, and steel requirements would step upward to nearly one million tons—a serious problem to throw on an industry already hard pressed to meet defense needs.

Should four 12-inch lines be laid to provide the desired capacity of 250,000 barrels daily, steel can be furnished from existing pipe mills at a rate sufficient to insure the completion of one line each 60 days, or a total of 8 months for the entire capacity. On the basis of tanker capacity released, construction of four parallel 12-inch lines would release the equivalent of 14 tankers for a year before the 24-inch line could be finished.

Railroads could handle pipe for four 12-inch lines with but 75 percent of the number of cars required to handle 24-inch pipe. Trenching for four small lines could be done without shoring, and with equipment now available. The 24-inch pipe would weigh a ton for each 16 feet, if of the weight apparently contemplated, and would run 2000 pounds for every 8 feet of line if the thickness is increased to permit standard operating pressures. Such weights would require special equipment.

Accessories for a 24-inch line would cost much more than four smaller ones. Four 12-inch lines could be equipped with valves at a saving of $410,000 over that of a 24-inch line if stations were of the same spacing. Since the big line is projected for half-inch thickness, however, it will be necessary to double the number of pump statoins to handle the desired capacity, and the difference in valve cost then becomes over $1,825,000 in favor of four smaller lines. Other savings in station equipment would naturally occur if but half the number of pump stations are required.

Only the delusion of grandeur attached to the building of the biggest pipe line must be sacrificed from an engineering viewpoint if four smaller lines are substituted.

Mexico's Out . . .

A practical trade basis, quickly arrived at, would solve the Mexican oil muddle. President Camacho's government is pictured as desiring a speedy solution to the problem which has cost the Republic of Mexico by reason of the former red Cardinas regime's action, a great deal of money and a monumental worry. American prospective investors naturally shy off from accepting the invitation of the Camacho government to invest in Mexico until the oil problem has been solved. There is face saving involved on both sides but where there seems to be a common will to solve the problem a way is likely to be developed.

A Pledge and a Code

By RAY L. DUDLEY, Publisher The Oil Weekly

IN THESE DAYS of national emergency it is easy to get into the mental attitude that unless one accepts all mandates, plans and ideologies coming from Washington as being for the good of the country, one is an obstructionist. Naturally, this idea is fostered by those in power in Washington just as it has been fostered by those in power in Vichy.

However, it must be obvious to those who have studied history that eternal vigilance is the price of liberty, both in times of emergency and in times of peace, and that constructive criticism really has more place in times of great emotional stress than it would have in times when the majority of people are engaged in calm thinking.

As we see the situation confronting more than one hundred and thirty million Americans, we are already in a war to preserve the form of government most of us hold dear—democracy—shaken, bruised and with a bloody head but still almost the same democracy which our forefathers founded so well.

We see the youth of the land being called by selective draft to bear arms and, if necessary, give their lives to defend our form of government and our way of living. At least this is what they are being told by our national leaders, this is what they believe, and this is what we believe.

The fact that these young men are being called for service places obligations on the rest of us which we may not shirk.

One obligation is to see that they are backed up in every possible way. Another obligation is that we who stay at home be outspoken, when the occasion arises, in defense of the democracy for which they fight. Otherwise their sacrifices might be in vain.

No man, be he private citizen or government official, has any right to impugn the patriotism of him who is vigilant in demanding that these emergencies be not prostituted by those in political power to retain their power, to increase it or to misuse it.

With full recognition that in times of national emergency there must be stronger centralization of government and greater powers given to the central government than in ordinary times and because we believe that we have a sacred duty to our country, we of THE OIL WEEKLY announce herewith our policy on matters of national import:

1. With our country in a virtual state of war we pledge every effort we can contribute to the winning of that war and our fullest support to the constituted authorities in their efforts toward its successful prosecution under the constitutional powers granted them.

2. We pledge ourselves to be outspoken when we see evidence of such misuse of power on the part of those who rule us as to warrant the fear that they may seek themselves to destroy that which we and they profess to be fighting for; and to be outspoken in our criticism when we believe that such criticism is merited or will aid to accomplish what we believe most Americans desire—the successful defense of democracy against foes from within and without.

As for bundsmen, fascist societies, communists and racketeers, white-collared socialists who have a plan for a socialistic state of their own imagined perfection, or other saboteurs with bomb, torch or strike, whether they be cloaked in the mantle of officialdom or be the hunted quarry of the FBI we have nothing but unrelenting antagonism.

Here is a pledge and a code by which our actions shall be guided in this emergency and we believe that it is a pledge and a code to which every patriotic American can and does subscribe.

EDITORIAL

THE OIL WEEKLY

JUNE 9, 1941

Vol. 102 No. 1

Washington Oil Round Up

Industry Speculates as to Deputy Coordinator . . . Trust Prosecutions Now Up to Ickes . . . House Passes Cole Pipe-Line Bill . . . Seek Increase in Aviation Gasoline Output . . . Connally Act Extended to Additional Fields

By B. F. LINZ, Washington Correspondent

DESIGNATION by President Roosevelt of Secretary of the Interior Harold L. Ickes as petroleum coordinator for national defense May 28, set in motion a series of developments which will have profound effect upon the oil industry of the United States.

The appointment of Ickes to approximately the same position of dominance over the oil industry which he held as administrator under the National Industrial Recovery Act was received with mixed sentiments, and there were immediate insinuations that the Administration had taken advantage of the defense emergency to gain the control of the industry which for eight years it had been unable to secure by other means.

There were indications that all further efforts to press the federal control legislation would be dropped, at least for the time being, and that the oil coordinator would depend upon the powers vested in him by the President to deal with any situation which might need corrective measures.

Considerable speculation as to who would be named deputy coordinator under Ickes was taking place within the industry's ranks. The deputy coordinator would be actually in command of the industry, and therefore would be extremely important. Some reports asserted that Ralph Davies, vice president of Standard Oil Company of California, had actually been sworn into office, but an announcement would not be forthcoming until June 9. Other reports asserted Ickes was favoring the selection of three men to serve jointly in this capacity. Names most frequently heard in connection with this office besides that of Davies were Charles F. Roeser, independent operator of Fort Worth, Wirt Franklin, independent operator of Oklahoma City and Ardmore, and Alvin J. Wirtz, recently resigned as Under Secretary of the Interior to do a political chore in Texas.

Immediate Developments

Immediate developments following the President's appointment of an oil coordinator were many, including:

1. The calling of a conference in San Francisco for June 7 to discuss the California crude price situation.

2. The placing of the disposition of anti-trust suits in the hands of the administrator by Attorney General Robert P. Jackson.

3. Extension of the Connally Act monthly report requirements to additional Texas fields, Louisiana and New Mexico.

4. A meeting of the API fact-finding committee with OPM officials and with Secretary Ickes to submit a "highly confidental" report on the Atlantic Coast situation.

5. Passage by the House of the Cole pipe-line bill.

6. Investigation by the House Rules Committee of the sale of United States oil and other materials of war to Japan and the Axis powers.

7. A request that the production facilities for 100-octane aviation gasoline be stepped up 25 percent.

8. Taking of initial steps to use some of the foreign-owned tankers lying idle in American waters to relieve the Gulf Coast-Eastern Seaboard distribution situation.

9. Urging of a conservation measure for the State of Illinois.

President's Instructions

In his letter notifying Secretary Ickes of his appointment, President Roosevelt pointed out that there are various problems which require immediate action in the interests of national defense, including: "the proper development, production and utilization of those reserves of crude oils and natural gas that are of strategic importance both in quality and location; elimination or reduction of cross hauling and petroleum and its products and the development of transportation facilities and of methods by which more efficient use can be made of existing transportation and storage facilities; balancing refining operations to secure the maximum yields of specific products with full consideration for requirements, the most economical use of the raw materials, and efficiency of production and distribution; and the elimination of the drilling of unnecessary wells in proven fields and of other unnecessary activities and equipment."

Ickes' Responsibility

As petroleum coordinator, the President said, Ickes would have the responsibility:

"To obtain currently from the states and their agencies, from the petroleum and allied industries, from the officers and agencies of your department, and from other appropriate federal departments and agencies information as to (a) the military and civilian needs for petroleum and petroleum products, (b) the factors affecting the continuous, ready availability of petroleum and petroleum products for those needs, and (c) any action proposed which will affect such availability of petroleum and petroleum products.

"To make specific recommendations to any appropriate department, officer, corporation or other agency of the federal government, particularly the Office of Production Management and the Office of Price Administration and Civilian Supply, to the appropriate agency representing any state or any combination of states, and to any appropriate industry or part thereof, as to action which is necessary or desirable, on the basis of your de-

terminations, to insure the maintenance of a ready and adequate supply of petroleum and petroleum products.

In carrying out these responsibilities," the President instructed, "it is expected that you will consult with the several officers and agencies of the federal government, and with the states acting severally or in any joint capacity, to the end that all governmental participation shall consistently further the purposes above outlined. It is also expected that you will consult with the petroleum industry and those industries which affect its functioning, to aid them in shaping their policies and operations in the discovery, development, production, processing, transportation, storage, distribution, marketing, consumption, and import and export of petroleum and petroleum products."

Frank Buttram Approves

The President's action in establishing federal control over the oil industry was hailed by Frank Buttram, president of the Independent Petroleum Association of America, as affording an opportunity for a coordinated defense effort which would be impossible so long as companies attempting to cooperate for defense activities were subject to "harassment by other governmental agencies" for violation of the anti-trust laws.

"I am quite sure that the petroleum industry will welcome and give the most careful consideration to whatever suggestions the new petroleum coordinator may make in order to develop the highest degree of efficiency and team work," Buttram said.

"I am also confident that the various state regulatory bodies will welcome the opportunity to coordinate their activities in order that all military and civilian needs may be promptly and fully supplied."

The IPA head pointed out that there are several problems which will be more capable of solution under the new setup.

"Our transportation problem which has been made acute by the diversion of so many tankers from our use to the British service is just one illustration out of many which present an opportunity for the coordination of the best thought and activity of the federal government, state governments and the industry," he said.

"I am sure from Mr. Ickes' record in the past that he will not encourage the further control of our industry by a few companies who want to increasingly surrender more and more of our American markets to the Dutch West Indies and other foreign countries by taking advantage of a national impulse to aid Britain. The fact that imports of fuel oil continue to increase while fuel-oil stocks on the Gulf are 2,000,000 barrels larger now than they were one year ago, an increase of over 30 percent, indicates the 'piling up' process resulting from the present favortism shown foreign oil."

Kansas Congressman Critical

Charging that the Administration had used the national defense emergency to gain a control over the oil industry which it had been unable to secure by other means in more than eight years, Representative Frank Carlson (Rep., Kans.) warned on the floor of the House June 2 that far from cooperating with every agency dealing with oil, as provided in the executive order, "rigid rules and regulations will soon be the order of the day."

Carlson asserted that there is no reason why the transportation inadequacy resulting from the transfer of 50 tankers to British service should not be overcome, and expressed displeasure that American tankers are used to haul Venezuelan crude from British account instead of transporting gasoline produced in this country. "In fact," he declared, "Great Britain should insist on this as a reward for our generosity."

He told the House that there is an ample supply of motor fuel in the United States for all demands, domestic and defense and that the purchase by Britain here of the oil she is taking from South America would not have interfered with our conservation program.

Representative Compton I. White (Dem., Idaho) challenged Carlson's statement of the adequacy of our reserves, disclosing that an expert from the Interior Department had testified before the Public Lands Committee that "of all the known resources that have been discovered in the history of this country we have used up over half of them."

Representative Fred L. Crawford (Rep., Mich.) also questioned the desirability of exporting domestic supplies "under the circumstances which now exist, and under the world-wide undertaking that the President has involved us in."

"I had been under the impression that we were doing the smart thing by conserving our petroleum products to the limit and letting other countries send petroleum products to us if they deem it advisable to do so," he said. "It seems to me we have certainly undertaken a world-wide role, particularly insofar as offshore areas are concerned that can be involved in the Western Hemisphere. Also in connection with the Philippine Islands.

"As to who will control the Dutch East Indies oil I do not know, but suppose the world controlled ships in such a way that oil goes to Japan and Russia and leaves us in a position where we must parallel our action with Britain and protect a great portion of China, a large part of India and that portion of the Malay States which is under British control, together with all of Latin America. Have we sufficient oil reserves to carry out that kind of an obligation? That is the question that is in my mind."

"It seems to me it is one of the things that we might start thinking about," Carlson admitted.

California Price Conference

Moving in on the California situation, Leon Henderson, administrator of the Office of Price Administration and Civilian Supply, called some 30 producing and buying companies to a meeting to be held in San Francisco June 7, for a discussion of recent advances in crude prices with Dr. J. K. Galbraith, director of the price division, and Quinn Shaughnessy, price executive in charge of the fuel section.

The OPACS pointed out that the price of California crudes was increased 5 to 10 cents a barrel on April 24 and that a further increase of 12 cents was announced by Standard Oil Company of California on May 23. Corresponding increases in the price of gasoline, amounting to a total of about 1 cent a gallon, followed.

"The last advance in crude oil prices is considered by OPACS to put California crude out of line as compared with prices of crude oil elsewhere in the country," it was stated. "Officials pointed out that crude oil prices are determined by the buyer and consequently are not subject directly to supply and demand factors. Furthermore, it is believed that claimed increases in costs do not justify the present level of prices for California crude oil."

In calling the conference, to

which Governor Culbert L. Olson was invited to send a representative, the OPACS served warning that the companies should submit data bearing on costs since "affirmative action" on the situation is contemplated.

Big Suit Up to Ickes

Disposition of the government's anti-trust suit against the major oil companies and the American Petroleum Institute, now pending in the District of Columbia Federal Court, was placed in the hands of Secretary Ickes by Attorney General Robert H. Jackson immediately upon the former's designation as oil administrator.

In a formal statement of the department's position, indicating that it would consent to a shelving of the case if such action was suggested by the Interior Secretary, the Attorney General declared he has "always urged the views embodied in the decision of the President to place the oil industry under the administrative supervision of the Secretary of the Interior."

Jackson called attention to a letter written to Senator Guy M. Gillette (Dem., Iowa) before the filing of the suit last September, in which he said: "In advocating revision of the anti-trust laws over three years ago to make them effective and clear, I repeatedly said that in my opinion the doctrine of compulsory competition embodied in the anti-trust laws is unwisely applied to oil production where the principle of conservation of an exhaustible and irreplaceable national resource should replace the principle of competitive exploitation.

"The companies seem to recognize this for they have tried to limit depletion by devices of their own, but without representation of the public interest or the consumer welfare, or that of smaller producers. Private conservation plans which restrain or discriminate against independents and disregard consumer interests violate the anti-trust laws, but they should not be replaced by a headlong race to exhaust petroleum supplies, but rather by a conservation plan which will be in the public interest."

At that time, he pointed out, he urged that the pendency of litigation should not delay or deter efforts to provide for the oil industry a system of conservation and orderly utilization of our basic petroleum resources.

"The anti-trust division has been negotiating a consent settlement of the oil cases," he said. "To avoid any conflicts with the administrative program which may be established by the Secretary of the Interior, further negotiations in the pending proceedings will be submitted to him, to the end that the national-defense objectives of the new oil control shall be in no way impeded."

Amplifying his statement in a letter to Secretary Ickes, June 3, the Attorney General suggested coordination of the Department of Justice and Oil Administration to the end that anti-trust problems might be dealt with quickly and satisfactorily.

"In fairness to the oil industry," he told the Secretary, "I believe that it should be made clear at the outset that the procedures are not intended to condone any circumvention of existing law but are designed to implement your program and to establish coordination between the administrative control of the oil industry and the enforcement of the anti-trust laws. This procedure is designed to deal both with pending litigation and with future matters that may arise."

The most expeditious way of dealing with the pending suit, he suggested, would be for the department to acquaint the Secretary from time to time with the general course of the negotiations and obtain his views on any major issues which may arise in connection with specific proposals that may be made by the industry prior to final decision by the department. "I assure you that we shall give careful consideration to your views regarding either the economic aspect of these problems or their effect upon national defense," he said.

"As to problems which may arise in the future," the Attorney General wrote, "my department stands ready to implement your activities. Any proposals for future civil or criminal proceedings under the anti-trust laws may, before authorization by me, be submitted to you for advice as to whether the proposed proceedings would in any way conflict with your program and, if not, as to whether because of your work the case should be conducted as a preferred proceeding. I will determine authorization and classification after receiving your advice, which I hope you can arrange to furnish expeditiously.

"If, in connection with your work, any questions arise as to the validity of any proposals for group action by the industry, this department will be happy to consider such proposals and to advise you of our views regarding them. Likewise, we stand ready at all times to furnish you such information as is now in our possession in regard to the industry. If at any time you should discover apparent violations of the anti-trust laws which are detrimental to national defense and will so advise this department, we will give such cases priority of investigation and prosecution. In matters not covered by this arrangement, we will establish informal cooperation with your office.

"I am confident that these steps will aid substantially in coordinating our work with your own to the end that the interests of national defense may be served."

More Areas Report Under Connally Act

First formal action of Secretary Ickes as oil administrator was to order the extension of the monthly reporting system under the Connally "hot oil" Act to the Gulf Coast and certain areas in West Texas, involving 441 fields with 37,395 wells flowing as of January 1, last; all of Louisiana's 120 fields with 2300 wells, and to important producing areas of New Mexico, involving 3333 wells.

In these areas, monthly reports will be required from producers, transporters and storers, and refiners to enable the federal government to secure accurate information regarding production and refining, and shipments.

The new fields brought under the act will be controlled from the headquarters of Federal Tender Board No. 1, at Kilgore, Texas, but branch offices probably will be established at strategic points within the several areas.

The area brought under the act in Texas, the department said, constitutes 93 percent of all the flowing wells in Texas, and 47.8 percent of the proven reserves of the country; Louisiana is estimated to have 4.6 percent of the proven national reserves, and the New Mexico area 3.5 percent.

API Report "Highly Confidential"

Meeting with officials of the Office of Production Management and later with Secretary Ickes, the fact-finding committee of the American Petroleum Institute on June 3 submitted a lengthy report on the current Atlantic Coast situa-

[*Continued on page 44*]

Use of

Stoichiometry

In Gas Cycling Operations

IN this article a method is shown for allocating the flow of dry gas from an input well to various producing wells in a cycling operation. This is done by means of stoichiometry or the use of a material balance in which a small percentage of air serves as a tracer. In addition to this information, these calculations give the engineer an idea of the denuding action which the dry gas has, both on the crude oil held in the reservoir and that which is produced at the surface.

By R. L. HUNTINGTON, Director
School of Chemical Engineering, University of Oklahoma

DRY gas often is returned to oil and distillate reservoirs both for increasing the ultimate recovery of the fields and for the conservation of gas. It is a matter of vital concern, especially to the distillate producer, that this dry gas does not channel its way toward the producing wells prematurely. Various methods are employed to prevent such channeling. In the case of distillate pools, the dry-gas-input wells are located at considerable distances from the producing wells in order to assure the minimum amount of dilution between the dry gas and the distillate-bearing fluid in the original reservoir.[1, 3, 5]

For the partially depleted oil fields, the penetration of dry gas to the surrounding producing wells is not a serious factor. Whenever the dry gas has a tendency to flow preferentially toward certain producing wells, the gas/oil ratio on those wells may become excessively high. The practice is then to cut back on the production of gas from those high ratio wells by building up a greater back pressure than that which is being maintained on other producing wells having lower gas/oil ratios. This kind of an adjustment will give a better distribution of the driving force of the gas, thereby helping the oil recovery as well as the enrichment of the dry gas with gasoline fractions as it goes through the formation.

Denuding Action of Dry Gas

The residue gas from the average natural gasoline plant has a decided stripping effect on the crude oil in the reservoir as the gas passes from the input well to the surrounding producing wells. The degree of enrichment of this gas will depend upon several factors:

1. The length of travel of the gas through sand, saturated with crude oil,
2. The temperature of the reservoir,
3. Pressure of the reservoir,
4. The relative amounts of natural gasoline in the crude oil and the dry gas.

It usually requires some few weeks of cycling in a certain area before the quantitative effect of the stripping action of the gas can be determined. In other words, a fairly steady state of flow conditions must be established in the part of the reservoir which is under consideration. It is well to have complete operating data on the area before the dry gas is injected, such as the oil and gas production from each well and gasoline content per thousand cubic feet of the formation gas.

Air Serves as a Tracer

Although the presence of air is undesirable when it comes to cycling operations, it is sometimes impossible to carry on this type of secondary recovery without drawing on gas which has been pulled in under vacuum from other parts of the field. By knowing the amount of air which is being injected into the input well or wells, the allocation of this gas can be made in a quantitative manner by analyzing the gas streams from the several producing wells for their oxygen content. There is some evidence that part of the atmospheric oxygen is adsorbed by the asphaltic constituents in the crude oil which would cause the ratio of oxygen to nitrogen to be somewhat lower in the gas from the producing wells.[6]

Stripping Effect of Residue Gas

The denuding action of the residue gas on the crude oil is due to the fact that the partial pressure of the gasoline constituents in the residue gas is less than the partial pressure of the same hydrocarbons in the crude oil. This

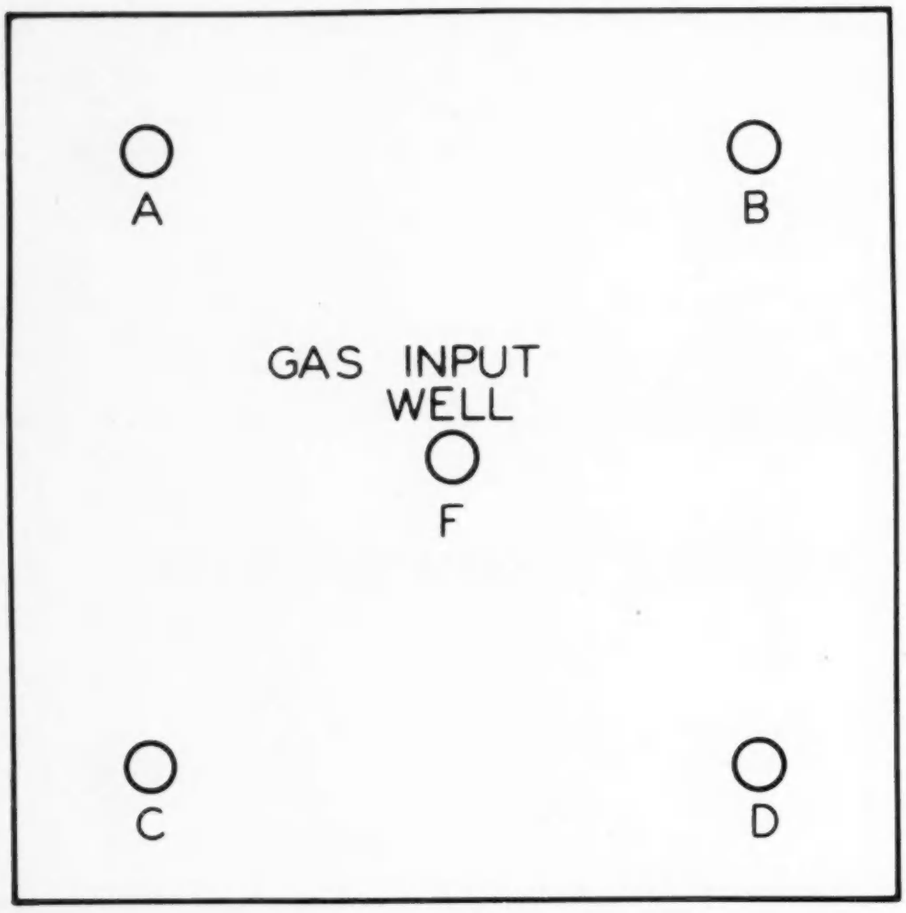

FIGURE 1

Diagram of area being recycled with gas. A, B, C, and D are producing wells.

transfer of gasoline from the crude oil into the cycling gas does not take place rapidly unless the gas bubbles its way through the crude oil in an intimate manner. Under average conditions in a reservoir, it is believed that a gas simply sweeps over the surface of the crude oil which is adhering to the sand grains, in which event the transfer of the gasoline constituents from the oil into the gas has to take place by the slow process of diffusion. This diffusional flow has to meet with one or more resistances such as the stagnant oil film and the gas film which is in contact with the oil.

A Sample Calculation of Gas Distribution

The allocation of the residue gas can best be understood by taking a specific case where gas is being returned to a well which is surrounded by producing wells.

In a depleted oil field one million standard cubic feet of residue gas analyzing by volume (10 percent air and 90 percent hydrocarbons) with negligible gasoline content are being returned from a gasoline plant to an input well (F) for increasing the production of crude oil. The nearby producing wells surrounding the input well show the following gas volumes, gasoline contents and air percentages after steady flow conditions have been established in the reservoir:

Producing Well	Bbls./ day	Vol. (cu. ft.) per day	Air %	Gals. Gaso./ 1000 cu. ft.
A	125	200,000	5.0	3.0
B	300	500,000	5.0	3.0
C	300	600,000	4.0	2.25
D	225	400,000	6.0	3.25

Before the dry gas injection was started into the well (F), the data on producing wells were:

Producing Well	Bbls./ day	Vol. (Std. cu. ft.) per day	Air %	Gals. Gaso./ 1000 std. cu. ft.
A	100	100,000	0	5.0
B	250	300,000	0	3.5
C	250	400,000	0	2.5
D	200	300,000	0	3.5

Calculate the volume of residue gas (10 percent air and 90 percent hydrocarbons) which is reaching each producing well.

1. How much recycle gas is going to producing wells more distant than wells A, B, C, and D?

2. How many gallons of gasoline does each 1000 std. cu. ft. of residue gas pick up in its traverse through the reservoir to each well?

3. Calculate the loss of crude oil fractions due to API reduction in produced crude.

(Refer to Table 1 for data and calculated results.)

Discussion of Calculations

Allocation of Residue Gas—The increase in gas volume on each producing well is not necessarily due to the presence of that much more residue gas. The residue gas can best be allocated by the analysis of the gas from the producing wells for oxygen content. For every cubic foot of air, it is reasonable to assume that 10 cubic feet of residue gas has found its way through the formation to that well, neglecting for the adsorption or combination of the atmospheric oxygen with the reservoir crude oil. It is easy to see, therefore, that 100,000 standard cubic feet of residue gas have gone to well A, 250,000 to well B, 240,000 to well C, and 240,000 to well D, a total of 830,000 cubic feet. This would mean that 170,000 cubic feet have gone to other wells located at

TABLE 1

Operating data on producing wells before recycling started.

WELL	PRODUCTION PER DAY		Vol. % of Air	Gals. Nat. Gas./1000 St. Cu. Ft.	Formation Gas-Oil Ratio	Gals. Nat. Gasoline Per Day	Gals. Nat. Gas./Bbl. Crude Oil	A.P.I. Gravity of Crude
	Bbls. of Crude Oil	St. Cu. Ft. of Gas						
A	100	100,000	.....	5.0	1000	500	5.00	38.5
B	250	300,000	.....	3.5	1200	1050	4.20	38.2
C	250	400,000	.....	2.5	1600	1000	4.00	37.7
D	200	300,000	.....	3.5	1500	1050	5.25	37.9

Operating data after several weeks of gas recycling.

WELL	Production Per Day		Gallons of Nat. Gas. Per 1000 St. Cu. Ft.	Gallons of Nat. Gas. Per Day	Gallons of Nat. Gas. Per Bbl. of Crude Oil	A.P.I. Gravity of Crude	Vol. % of Air	Vol. of Air Per Day	Vol. Residue Gas to Each Producing Well
	Bbls. of Crude Oil	Std. Cu. Ft. of Gas							
A	125	200,000	3.0	600	4.80	38.0	5.0	10,000	100,000
B	300	500,000	3.0	1500	5.00	37.5	5.0	25,000	250,000
C	300	600,000	2.25	1350	4.50	37.0	4.0	24,000	240,000
D	225	400,000	3.25	1300	5.78	36.5	6.0	24,000	240,000
F	Input	1,000,000	.....	....	....	....	10.0	.....	830,000 Total

Calculated gasoline, allocated between formation and residue gas.

WELL	Formation Gas	G.P.M.	Gals. Gasoline from Formation Gas	Gals. Stripped Out by Residue Gas	Calculated Daily Loss of Crude Oil Due to A.P.I. Reduction in Produced Crude
A	100,000 — 30(100)x =	96450 × 5.00 =	482	100,000 × 1.18 = 118	125 × .5 × .025 × 42 = 65.5 gals.
B	250,000 — 30(250)x =	229000 × 3.50 =	800	250,000 × 2.79 = 700	300 × .7 × .025 × 42 = 220.0 gals.
C	360,000 — 30(240)x =	345350 × 2.50 =	862	240,000 × 2.03 = 488	300 × .7 × .025 × 42 = 220.0 gals.
D	160,000 — 30(240)x =	135200 × 3.50 =	4,470	240,000 × 3.45 = 830	225 × 1.4 × .025 × 42 = 330.0 gals.

Calculation Details for Gasoline Gallonage in Formation and Residue Gas Streams

Let x = Number of gallons of natural gasoline denuded (or stripped) from the crude per 1000 standard cubic feet of residue gas.

Let 30 = Standard cubic feet of vapor which one gallon of dissolved gases would yield

For well A: $\left[\frac{100{,}000-30(100)x}{1000}\right] 5 + 100(x) = 600$ — Solving, x = 1.18 gals. denuded per 1000 cu. ft. residue gas

For well B: $\left[\frac{250{,}000-30(250)x}{1000}\right] 3.5 + 250(x) = 1500$ — x = 2.79 gals. denuded per 1000 cu. ft. residue gas

For well C: $\left[\frac{360{,}000-30(240)x}{1000}\right] 2.5 + 240(x) = 1350$ — Solving for gals. stripped per 1000 cu. ft. of dry gas:

$(360 - 7.2x)2.5 + 240x = 1350$

$900 - 18x + 240x = 1350$

$222x = 450$

$x = 2.03$

For well D: $\left[\frac{160{,}000-30(240)x}{1000}\right] 3.5 + 240(x) = 1300$ — Solving:

$(160 - 7.2x)3.5 + 240x = 1300$

$560 - 25.2x + 240x = 1300$

$214.8x = 740$

$x = 3.45$

greater distances from the input well F.

Formation Gas Flowing to Each Well—Since the residue gas has caused an increase in the gallonage of natural gasoline present in the raw gas from each well, it is necessary to take into account the volume which this vapor (denuded from the crude oil) will occupy. It is assumed that the composition of these vapors from the crude will consist of mixture of hydrocarbons comparable to a 50-50 molal mixture of normal butane and normal pentane. A gallon of these liquefied hydrocarbons when vaporized would occupy approximately 30 cubic feet of space. By letting X equal the number of gallons of natural gasoline which are denuded by 1000 standard cubic feet of residue gas in its passage over and through the reservoir crude, a material balance can be made, allocating the gasoline between the formation gas and the enriched residue gas. It is assumed that the formation gas itself does not change in composition. These calculations as shown in Table 1 indicate a stripping action by the residue gas ranging from 1.18 gallons per 1000 cubic feet for well A up to 3.45 gallons for well D.

Calculated Loss of Produced Crude Oil Volume—The lowering of the API gravity of the crude oil is often observed where recycling operations are carried out. It has been found that the average high-gravity Mid-Continent crude oil shrinks about 2.5 percent in volume for each degree API loss in gravity.[2, 4] In the case of well A, this loss is found to be 65.5 gallons or 55.5 percent of the amount of gasoline denuded by the residue gas. In other words, 44.5 percent of the stripping action took place on the reservoir crude oil which was not produced. In the case of well D, only 330/830 = .397 was the fraction of the natural gasoline which was denuded from the produced crude oil.

It is to be observed (Table 1) that the natural-gasoline content is lowered in the gas coming from each well as the result of the recycling operations; however, the natural-gasoline gallonage per barrel of produced crude oil increases with the exception of well A.

Conclusions

Calculations involving material balances on the gas and gasoline in a cycling operation are helpful to the engineer in gaining a better insight into the mechanism of the flow through the reservoir, and in the utilization of the dry cycle gas to the best advantage for the profitable operation of an oil-producing property.

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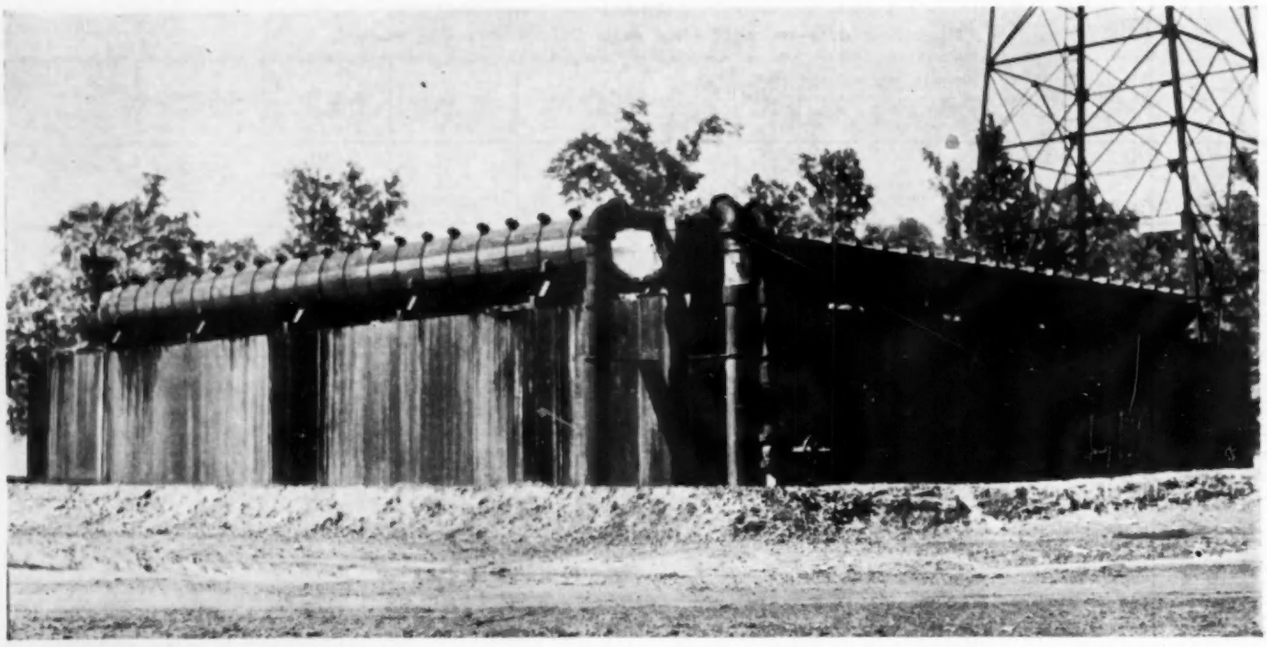


Steel salt water disposal tank (at top), showing the large inlet pipes and the water troughs around the top. Behind the tank is the injection well.

A broad concrete shoulder extends from under the tank on all sides. Steel rods of the structural reinforcement for the concrete base are turned upward to tie in the wall to be constructed later.

Concrete Bases Meet Future *Salt Water Tank* Requirements

By GORDON B. NICHOLSON, Staff Writer

CONCRETE-BASED steel salt-water-disposal tanks designed for double service are the innovation of one oil company in the East Texas oil field. In keeping with the tendency of the modern operator toward finding a common solution for today's problems and those of tomorrow, the company has shown foresight in the construction of the tanks, their unusual feature being an adaptability for conversion into concrete reservoirs at little expense.

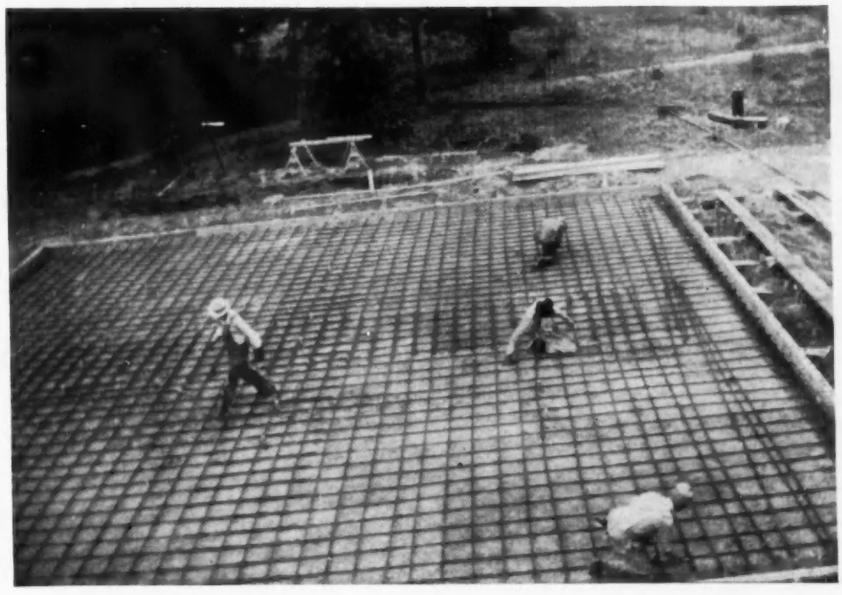
With salt-water disposal in the East Texas field a major problem, various methods for its storage and disposition have been devised. The sandy, permeable soil prevalent in the area makes impossible, in many cases, the satisfactory use of ordinary earthern evaporation pits, and with the development of salt-water-injection wells, the use of steel tanks for temporary storage has become widespread. The tanks are costly, and, although sand blasted and treated, are attacked quickly by the corrosive elements in the brine and their period of usefulness reduced.

Sinclair Prairie Oil Company, seeking to prolong the economic utilization of its tanks, installed several with concrete bases, each consisting of a rectangular concrete mat slightly larger in all lateral dimensions than the tank. When the steel container is placed in the center, a 1-foot concrete shoulder extends from underneath on all sides. In time, after the steel tank corrodes and becomes useless, concrete walls may be constructed around the perimeter of the mat, and when the old steel walls are removed, a concrete reservoir will replace the one of steel.

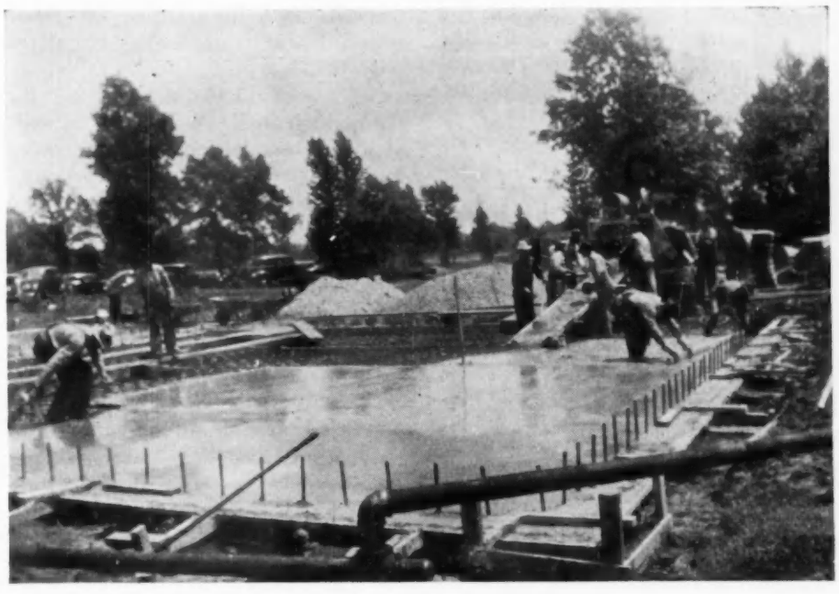
A typical tank is located in a heavily wooded section near the town of Salem in the southwestern end of the big field. In operation since May of 1940, the tank, serving two leases with a total of 66 wells, has successfully handled over 300,000 barrels of salt water.

The structure has a storage capacity of 2500 barrels, its dimensions being 43 x 44 feet, with walls 7½ feet in height. The salt water is piped into the tank through large lines which empty into troughs around the top, an adjustable spilling trough regulating the volume of water entering the reservoir. Constructed of heavy steel plates welded throughout, the receptacle contains two ordinary "under-over" baffles for the elimination of sediments. A float control governs the amount of water gravitated to the filter tank for final purification prior to injection into the input well.

The operators chose a site for the tank located near the salt-water-disposal well, then cleared and leveled the location with draglines. A network of ⅝-inch rods spaced at one-foot intervals forms the structural reinforcement for the concrete, with the ends of the rods "L" shaped and turned upward to a height of 18 inches. The exposed ends, being short, vertical rods, are destined to serve as the framework and support for the concrete walls which will be constructed at a later time. The specified thickness of the mat is 6 inches except near the edges where it increases to 1 foot. To make certain of the homogeneity of the slab, the entire mat, consisting of 42 yards of concrete, was poured in a single day, afterwards being covered and cured under water to assure its firmness and cohesion. This precaution will reduce to a minimum the amount of seepage after the concrete assumes its place as tank bottom.

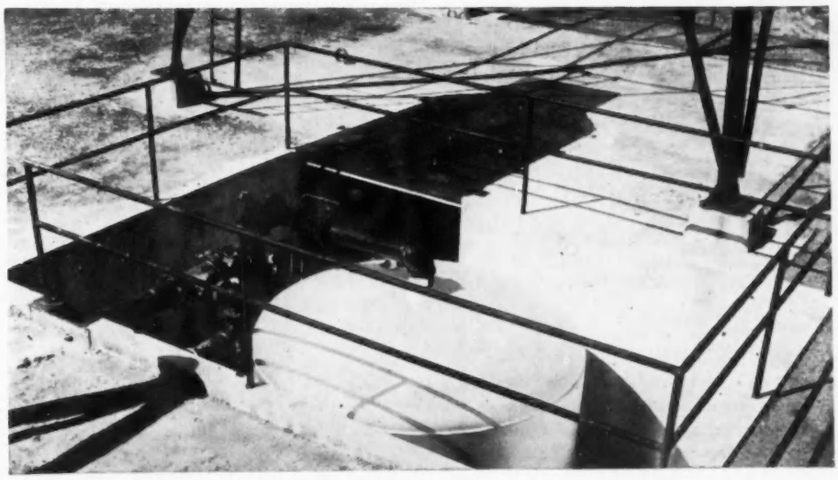


A network of ⅝-inch steel rods (above) to reinforce the structure was placed in position before pouring the concrete.



The slab (left) was made of 42 yards of concrete poured in a single day to assure its homogeneity.

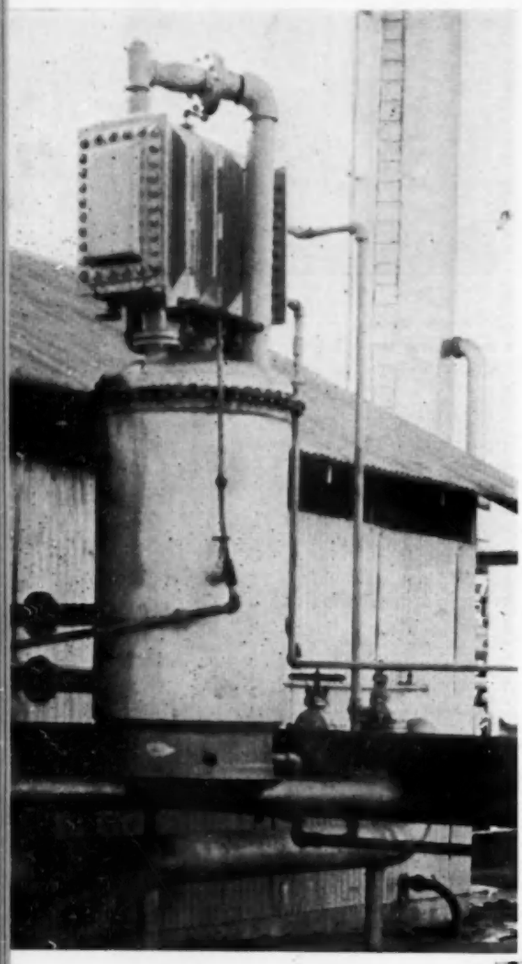
In coping with the disposal problem in this manner, the company receives double life for its reservoirs. Concrete quickly replaces the steel walls, and tank replacements that would usually amount to considerable expenditure and a temporary loss of means of salt-water-disposal become a relatively inexpensive operation.



A filter tank gives final purification before the salt water is returned to formation.

Condenser

Maintains High Jacket Water Temperature



THE performance of a battery of multi-cylinder gas engines driving pumps was stepped up by converting the cooling system from the conventional individual radiator to a common main and tank, topped by a condenser which enabled water at the engines to be maintained at any given temperature.

With optimum temperature determined at 210° F., it is necessary only to regulate the flow of coolant through the condenser so as to maintain the desired pressure within the vapor system, at which point the fluid temperature remains constant under standard operating conditions.

The original cooling-water lines were removed, radiator cores done away with, and all jacket outlet connections tied into a main tying in to the side of the common storage and pressure-head tank. Vapor space at the top of the tank commmunicated directly with the upper tube header of the condenser, the returns from the base being designed to feed the condensate through extended nipples into the lower portion of the tank.

By setting the tank at a height to afford a head of eight feet on the suctions of the water pumps on each engine, uniform flow is assured, a four-inch main with two-inch branches to the individual units providing ample flow of water at the desired temperature.

Provision is made for adding make-up water to the system to replace the slight leakage past pump glands and elsewhere in the closed system, with a drain to permit periodic flushing of the tank to remove sediment.

With lubricating oils selected to perform under the raised engine temperatures, the closed system with condenser permits a small supply of treated water to be used in the engines where normal water conditions are bad, with the hard or otherwise objectionable water being circulated only through the condenser.

Where the fluid handled by the pumps driven by the engines is suitable, the condenser may be cooled by a bypass on the main discharge line, with suitable regulating valve to reduce the pressure to the desired figure, and the small amount of fluid required to condense the vapors returned to the suction lines for rehandling.

Since, using efflux water at 210 degrees, the amount of waste heat is decreased over that encountered in conventional cooling systems, the amount of heat to be dissipated is less, all lines act as accelerated radiators, and the condensing system may be small enough to be readily supported atop the common supply tank.

The water tank, above, with condenser attached is set to provide a head of eight feet and assure each engine a steady flooded suction.

Automotive type engines, right, run on natural gas. The engines operate without individual radiators and take cooling water from the outside tank, where the temperature is maintained at 210° F.

Improved Markets Conducive To Active Drilling in May

By L. J. LOGAN, Associate Editor

STIMULATED by increasing prices of refined products and of crude oil, drilling proceeded in May upon an active basis, and for the first five months of this year, well completions on a daily average basis have been only 5 percent less numerous than last year.

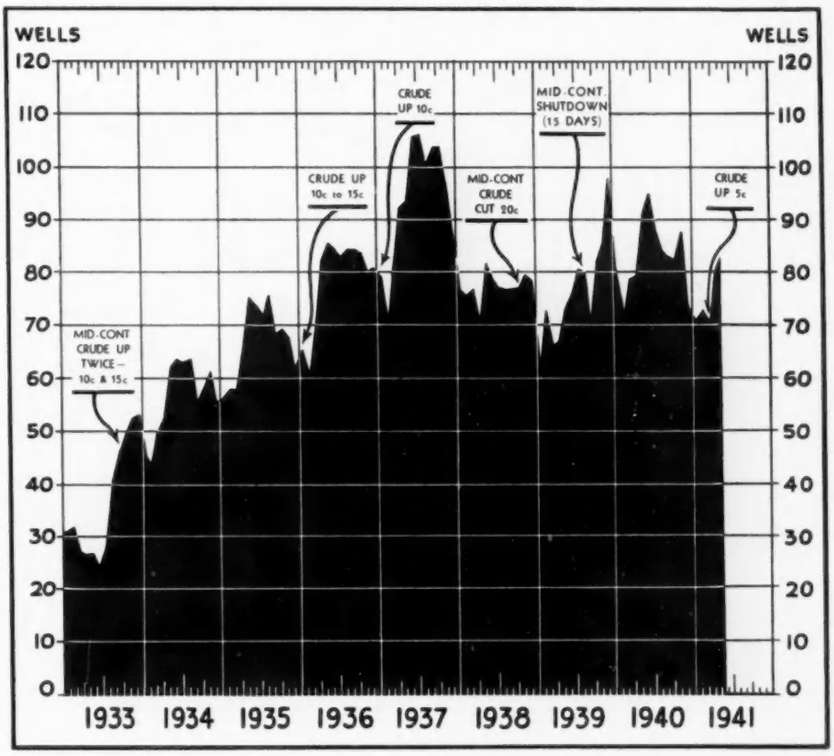
Field work expanded materially in April because of the improvement of the industry's markets and the seasonal increase in activity; and development was maintained upon the broadened scale in May as markets further improved, while weather conditions continued seasonally conducive to drilling.

For June, moreover, well-sustained field development is indicated, in full reflection of the latest advances in crude oil prices throughout the country.

In the crude price revisions around April 1, Mid-Continent crudes were advanced five cents a barrel, and on April 24, California crudes were raised on the average around six cents a barrel. While those increases were comparatively small, they stimulated drilling, particularly inasmuch as there was much talk at the same time that a further increase was warranted and should materialize soon.

The general advance of crude

Average Daily Well Completions in U. S., by Months
(Latest monthly data subject to slight revision)



Miscellaneous Well Completions in the United States in 1941

(This tabulation gives detailed information on "miscellaneous" wells included in accompanying main table of all completions.)

STATE OR DISTRICT	MONTH OF MAY									FIRST FIVE MONTHS OF 1941								
	Total Miscellaneous	Old Wells Deepened					Water Input	Gas Input	Salt Water Disposal	Total Miscellaneous	Old Wells Deepened					Water Input	Gas Input	Salt Water Disposa
		Total	Oil	Gas	Dry	Initial Production					Total	Oil	Gas	Dry	Initial Production			
Colorado	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..
Illinois	34	32	31	..	1	2,890	..	1	1	85	79	72	..	7	9,571	..	1	5
Indiana	1	1	..	..	1	..	..	..	..	14	11	9	..	2	792	..	1	2
Kansas	12	12	12	..	..	9,335	..	..	..	48	42	36	..	6	39,937	..	..	6
Kentucky	3	3	3	..	..	105	..	..	..	5	5	4	..	1	113	..	..	..
Louisiana	1	1	..	..	1	..	..	..	..	3	3	..	..	3	..	..	..	..
North	..	..	..	..	..	..	..	..	..	2	2	..	..	2	..	..	..	..
South	1	1	..	..	1	..	..	..	..	1	1	..	..	1	..	..	..	..
Nebraska	1	1	..	..	1	..	..	..	..	1	1	..	..	1	..	..	..	..
New Mexico	..	..	..	..	..	..	..	..	..	1	1	1	..	..	5	..	..	..
New York: Allegany	20	..	..	..	..	..	20	..	..	104	..	..	..	..	..	104	..	..
Ohio	13	1	..	1	..	..	5	7	..	59	3	..	3	..	..	49	7	..
Oklahoma	16	16	14	1	1	1,135	..	..	..	87	79	58	4	17	8,370	..	5	3
Pennsylvania: Bradford	127	..	..	..	..	..	127	..	..	570	..	..	..	..	..	570	..	..
Texas	9	5	3	1	1	90	..	4	..	29	23	12	2	9	3,800	..	4	2
East Texas Field	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	2
Rest of East Texas	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..
North Texas	6	2	1	..	1	4	..	4	..	13	9	3	..	6	559	..	4	..
South Texas	3	3	2	1	..	86	..	..	..	8	8	5	2	1	1,286	..	..	..
Corpus Christi	1	1	1	..	..	10	..	..	..	4	4	4	..	..	1,210	..	..	..
Laredo	2	2	1	1	..	76	..	..	..	4	4	1	2	1	76	..	..	..
West Texas	..	..	..	..	..	..	..	..	..	5	5	4	..	1	1,955	..	..	..
West Virginia	2	2	..	2	..	..	..	..	..	9	9	..	9	..	..	..	..	..
Wyoming	4	4	4	..	..	2,100	..	..	..	7	7	6	1	..	2,258	..	..	..
Total United States	243	78	67	5	6	15,655	152	12	1	1,023	264	198	19	47	64,846	723	18	18

Additional Drilling Rigs Put Into Service in May

STATE OR DISTRICT	TOTAL RIGS IN OPERATION (Drilling, Rigs Up, Shut Down)				DETAILS OF JUNE 1, 1941 FIELD ACTIVITY					
					Rigs in Operation			Prelim. Activity		
	Year Ago June 1, 1940	Month Ago May 1, 1941	Now June 1, 1941	Percent Change From Year Ago	Drilling	Rigs Up	Shut Down	Derricks	Locations	Total Operations
Alabama	4	6	8	+100.0	3	....	5	....	....	8
Arizona	8	7	37	+362.5	18	5	14	3	2	42
Arkansas	32	39	7	— 72.1	1	....	6	1	....	8
California	329	266	283	— 14.0	192	51	40	....	76	359
Colorado	30	27	28	— 6.7	5	2	21	....	....	28
Florida	3	2	3	....	....	....	3	....	....	3
Georgia	2	3	3	+ 50.0	....	....	3	....	1	4
Illinois	468	320	333	— 28.8	258	35	40	....	65	398
Indiana	79	74	75	— 5.1	44	8	23	....	13	88
Iowa	2	5	4	+100.0	1	....	3	....	....	4
Kansas	306	265	271	— 11.4	226	22	23	17	25	313
Kentucky	59	37	42	— 2.9	19	4	19	....	4	46
Louisiana	206	199	191	— 7.3	154	21	16	19	96	306
North Louisiana	55	74	57	+ 3.6	38	7	12	3	4	64
South Louisiana	151	125	134	— 11.3	116	14	4	16	92	242
Michigan	165	138	144	— 12.7	88	19	37	10	16	170
Mississippi	36	45	29	— 19.4	17	6	6	3	10	42
Missouri	17	15	15	— 11.8	4	....	11	....	1	16
Montana	43	49	45	+ 4.7	21	2	22	....	....	45
Nebraska	14	35	27	+ 9.3	14	2	11	2	2	31
New Mexico	155	103	117	— 24.5	69	5	43	....	7	124
New York	107	65	67	— 37.4	48	7	12	5	10	82
Ohio	394	270	280	— 28.9	201	30	49	17	47	344
Oklahoma	364	371	356	— 2.2	268	38	50	32	39	427
Oregon	....	3	3	....	2	....	1	....	....	3
Pennsylvania	388	366	391	+ 0.8	282	40	69	27	68	486
South Dakota	2	....	....	....	....	....	....	....	....	....
Tennessee	6	8	8	+ 33.3	4	....	4	....	....	8
Texas	1,247	1,313	1,306	+ 4.7	1,034	100	172	79	767	2,152
East Texas Field	9	23	23	+155.6	14	7	2	5	8	36
East Texas Border Co.'s	15	15	10	— 33.3	5	1	4	....	3	13
Rest of East Texas	35	83	64	+ 82.9	42	3	19	9	15	88
North Texas	214	200	199	— 7.0	170	8	21	13	147	359
South Texas	298	304	328	+ 10.1	268	28	32	25	276	629
Corpus Christi Area	156	175	177	+ 13.5	152	17	8	13	83	273
Laredo Area	80	77	95	+ 18.8	77	7	11	8	133	236
San Antonio Area	62	52	56	— 9.7	39	4	13	4	60	120
Texas Gulf Coast	152	124	126	— 17.1	106	6	14	8	79	213
Texas Panhandle	137	106	108	— 21.2	83	18	7	1	27	136
West Texas	293	370	375	+ 28.0	305	19	51	18	186	579
West Central Texas	94	88	73	— 23.3	41	10	22	....	26	99
Utah	7	5	7	....	3	....	4	....	....	7
Washington	....	3	....	....	....	....	....	....	....	....
West Virginia	119	191	194	+ 63.0	140	20	34	12	32	238
Wyoming	63	57	61	— 3.2	24	2	35	....	7	68
Total United States	4,655	4,287	4,335	— 6.9	3,140	419	776	227	1,288	5,850

postings that began around May 19 involved a 10-cent increase for the Mid-Continent and Middle West, a 15-cent raise for Pennsylvania grade crude, and an average increase of six cents a barrel for California. These increases did not occur early enough, however, to be reflected to a great extent in the drilling statistics of the month, and the effects should be shown in June statistics.

Wells were completed in the United States in May at the rate of 83.1 daily, or 582 weekly, 2328 having been finished in the four weeks ended May 26. The May average of 83.1 compared with 84.9 completions daily in April and with 90.9 daily in May of last year.

In the first five months of 1941, well completions in the United States, on a daily average basis, were 5.2 percent fewer than in the like period of 1940.

Although the nation as a whole has had less drilling this year than last year, there have been more completions per week in 1941 than in 1940 in California, Colorado, Montana, Indiana, Kentucky, Ohio, Kansas, Eastern Texas, and the San Antonio area of Southwest Texas.

Completions in First Five Months of 1941 Are Within 5 Percent of Those in 1940

STATE OR DISTRICT	MOTNHLY COMPLETIONS								CUMULATIVE COMPLETIONS—First 5 Months							
	Total			Details for May, 1941[1]					Total			Details for 5 Months of 1941				
	Year Ago (May, 1940)[2]	Month Ago (April, 1941)[3]	Latest Data (May, 1941)[1]	New Wells Drilled for Oil and Gas			Miscellaneous[5]	Initial Oil Production	1940[4]	1941[5]	Percent Change in Weekly Average	New Wells Drilled for Oil and Gas			Miscellaneous[5]	Initial Oil Production
				Oil	Gas	Dry						Oil	Gas	Dry		
Arkansas	12	16	13	8	....	5	....	1,035	78	63	— 14.3	35	....	28	.....	7,048
California[6]	105	98	81	76	....	5	....	48,962	459	445	+ 1.9	363	2	80	.....	289,811
Colorado	....	3	....	....	....	....	....	....	3	6	+ 123.1	1	1	3	1	15
Illinois	293	268	223	140	1	48	34	31,661	1,439	1,232	— 10.2	850	7	290	85	180,168
Indiana	28	39	44	23	3	17	1	4,976	156	196	+ 31.0	102	16	64	14	15,762
Iowa	....	....	1	....	....	1	....	....	....	1	....	....	....	1	....	....
Kansas	180	164	186	122	5	47	12	162,112	697	810	+ 21.8	541	21	197	51	797,084
Kentucky	18	19	33	15	....	15	3	598	98	109	+ 15.6	39	1	64	5	2,408
Louisiana	151	97	102	66	3	32	1	10,801	653	523	— 16.2	349	26	145	3	72,590
North Louisiana	51	23	42	26	2	14	....	2,043	234	191	— 14.2	116	19	54	2	14,123
South Louisiana	100	74	60	40	1	18	1	8,758	419	332	— 16.8	233	7	91	1	58,467
Michigan	72	67	56	16	5	35	....	1,575	507	313	— 35.2	120	23	170	.....	20,133
Mississippi	22	8	20	16	....	4	....	11,305	72	66	— 3.7	51	1	14	.....	32,281
Missouri	7	5	5	....	1	4	....	....	35	25	— 25.2	1	5	19	.....	5
Montana	18	16	2	2	....	....	....	245	62	66	+ 11.7	43	16	7	.....	7,474
Nebraska	....	5	10	4	....	5	1	729	....	37	.....	13	1	22	1	3,266
New Mexico	51	29	28	23	....	5	....	3,645	315	141	— 53.1	109	6	25	1	26,775
New York	77	56	67	46	....	1	20	308	442	281	— 33.5	174	2	1	104	1,091
Ohio	54	139	118	27	42	36	13	788	296	613	+ 117.2	140	271	143	59	3,008
Oklahoma	167	161	174	95	14	49	16	33,200	896	787	— 8.1	412	59	228	88	150,348
Pennsylvania[7]	356	344	311	138	32	14	127	159	1,591	1,445	— 4.8	657	138	50	600	898
South Dakota	....	....	....	....	....	....	....	....	1	....	.....	....	....	....	.....	....
Tennessee	1	1	....	....	....	....	....	....	12	6	— 48.1	....	....	6	.....	....
Texas	880	784	801	592	20	180	9	360,185	4,250	3,720	— 8.3	2,710	96	885	29	1,663,780
East Texas Field	21	40	46	44	....	2	....	116,722	122	265	+ 129.1	257	....	6	2	537,856
East Texas Border	3	3	5	1	2	2	....	17	6	12	+ 111.1	2	7	3	.....	329
Rest of East Texas	22	44	64	47	3	14	....	18,335	101	186	+ 95.5	117	15	53	1	45,675
North Texas	196	210	189	116	....	67	6	33,913	928	888	.....	553	3	319	13	174,682
South Texas	206	203	168	120	7	38	3	43,390	1,111	895	— 15.6	591	31	265	8	227,463
Corpus Christi	115	111	89	77	2	9	1	37,134	524	472	— 5.9	366	12	90	4	186,210
Laredo	75	76	58	32	3	21	2	5,877	488	323	— 31.8	169	17	133	4	35,040
San Antonio	16	16	21	11	2	8	....	379	99	100	+ 7.9	56	2	42	.....	6,213
Texas Gulf Coast	128	48	59	48	1	10	....	9,455	524	276	— 45.0	211	15	50	.....	54,711
Texas Panhandle	51	52	43	38	3	2	....	8,196	242	215	— 9.1	195	8	12	.....	42,574
West Texas	177	140	180	164	....	16	....	127,314	890	750	— 12.5	692	2	51	5	565,147
West Central Texas	76	44	47	14	4	29	....	2,843	326	233	— 25.6	92	15	126	.....	15,343
Utah	1	....	....	....	....	....	....	....	1	....	.....	....	....	....	.....	....
West Virginia	48	48	47	9	25	11	2	80	224	259	+ 21.8	28	172	50	9	267
Wyoming	5	10	6	2	....	....	4	3,453	59	38	— 30.8	27	....	4	7	18,415
Total United States	2,546	2,377	2,328	1,420	151	514	243	675,817	12,346	11,182	— 5.2	6,765	864	2,496	1,057	3,292,627

[1] Wells completed in 4 weeks, or 28 days, ended May 24, 1941. [2] Wells completed in 4 weeks, or 28 days, ended May 25, 1940. [3] Wells completed in 4 weeks, or 28 days, ended April 28, 1941. [4] Wells completed in 22 weeks, or 154 days, ended May 25, 1940. [5] Wells completed in 21 weeks, or 147 days, ended May 24, 1941.
[6] California figures from the American Petroleum Institute except for May, 1941. [7] Bradford, Pennsylvania figures from The Producers Monthly except for May, 1941.
[8] Details appear in accompanying table.

Secondary Recovery of Petroleum by Air Drive

By H. KRUTTER
School of Mineral Industries, Pennsylvania State College

IN 1911 L. I. Dunn made the first attempt on a commercial scale to increase the recovery of a depleted oil field by the application of an air drive. Application of air drive, however, did not become common in the Venango region until about 1925. Comparatively little laboratory research has been done on secondary recovery by means of air drive. One of the major problems of laboratory research is to correlate the results obtained in the laboratory with field performance. When this stage is reached, it will be possible for the laboratory to contribute to a more efficient secondary recovery procedure. This goal of correlation has not yet been achieved. The purpose of the accompanying report is to present various experiments which afford an insight into the mechanism of the flow of fluids in porous media.

It was presented at the Tenth Annual Petroleum and Natural Gas Conference, held at Pennsylvania State College, and is published by permission of the director of Mineral Industries Research.

THE mechanism of the flow of fluids through oil sands is an enormously complex one. An attempt must be made to separate the various variables and determine their individual roles in the complete picture. Progress in research is generally made by first studying the simplest problems and then attempting to advance to the more complicated problems.

A notable advance in the study of oil sands was made when the clear distinction between the concepts of permeability and porosity was recognized. However, as valuable as this step was, it is only a beginning as far as the actual oil-field problems are concerned. It is found that many other factors enter into the problem. Some of the factors which are important in the secondary recovery process are the original condition of the field, the depletion of the field during flush production, the rock pressure, the oil saturation, the connate water content, the surface and interfacial forces, the viscosity of the oil, the gas in solution in the oil, the pore pattern in the sand, the horizontal and vertical variation of permeability, the chemical and physical nature of the material coating the sand grains, the arrangement and spacing of the input and producing wells, the pressures applied and their method of application, and the secondary drive medium. The experiments to be described will merely scratch the surface of this enormous problem.

TABLE 1
Stepwise Pressure Experiments

Core Number	Perm. Md.	Porosity Percent	Pore Volume cc.	Oil in Core cc.	Initial Saturation	Oil Collected cc.	Percent Oil Collected	
							Pore Volume Basis	Oil in Core Basis
H16	1.85	11.3	22.2	22.2	100	7.24	32.6	32.6
H1	3.19	12.3	23.7	23.24	98.1	6.41	27.0	27.6
H19	4.22	12.1	24.3	24.0	98.8	8.17	33.6	34.0
B8	4.85	11.2	22.2	22.2	100	8.54	38.5	38.5
B4	7.95	11.8	23.4	23.49	100	5.71	24.4	24.3
H14	9.7	13.6	27.2	27.2	100	8.69	31.9	31.9
H17	12.1	11.3	22.2	21.75	98.0	9.11	41.0	41.9
H20	18.8	15.5	30.5	29.95	98.2	12.41	39.8	41.4
H2	20.6	15.1	29.0	29.0	100	11.67	40.2	40.2
H12	37.9	18.9	37.9	37.7	99.5	8.00	21.1	21.2
B6	40.8	11.2	21.2	21.1	99.7	8.10	38.2	38.4
H13	48.8	15.7	32.6	32.6	100	9.57	29.4	29.4
H10	49.0	15.3	31.4	31.4	100	7.48	23.8	23.8
H9	95.	9.2	19.4	19.4	100	6.34	32.7	32.7
H8	168	9.01	17.6	17.65	100.2	5.22	29.7	29.6
1	175	20.2	36.0	36.2	100.6	9.10	25.3	25.1
B1	177	23.2	44.8	44.2	98.7	11.77	26.3	26.6
B2	192	23.7	39.1	38.8	99.2	10.28	26.3	26.5
H11	213	23.1	44.9	44.9	100	15.68	33.9	34.9
B7	219	26.8	48.0	47.4	98.6	11.76	24.5	24.8
4	218	20.4	37.4	37.4	100	14.36	38.4	38.4
2	224	20.6	36.2	35.92	99.2	14.57	40.2	40.6
B3	235	26.8	50.3	49.96	99.3	9.76	19.4	19.5
B5	256	21.4	40.8	40.4	99.0	12.10	29.7	30.0
H18	469	25.2	49.7	49.4	99.3	11.90	23.9	24.1
H6	1080	28.8	49.9	49.8	99.8	17.59	35.3	35.3
S6	2430	11.7	20.2	20.15	99.8	4.07	20.1	20.2
H4	2550	10.1	20.4	20.5	100.4	6.97	34.2	34 0
H5	3440	14.8	30.0	30.2	100.7	7.17	23.9	23.7
Average Data	.....	16.9	32.2	32.0	99.6	9.61	30.5	30.7

The first problem studied, was the variation in rate of flow of air through consolidated oil-field cores as a function of the degree of saturation of the cores. For this series of experiments, small cores approximately ¾-inch in diameter and 1 inch in length were saturated with a close cut oil and then subjected to air drive. The instantaneous rate of flow of air as a function of time was recorded. The core was removed from the holder at suitable intervals of time and weighed to determine the saturation. The results of these experiments can best be presented, by introducing the concept of *relative permeability*. The relative permeability to air, K(s)/K, is defined as the ratio of the effective permeability to air when the saturation of the core is (s) to the specific permeability (K) to air of the completely extracted core. That such a concept is valid will be observed from the discussion of the results.

The experiments on a Venango

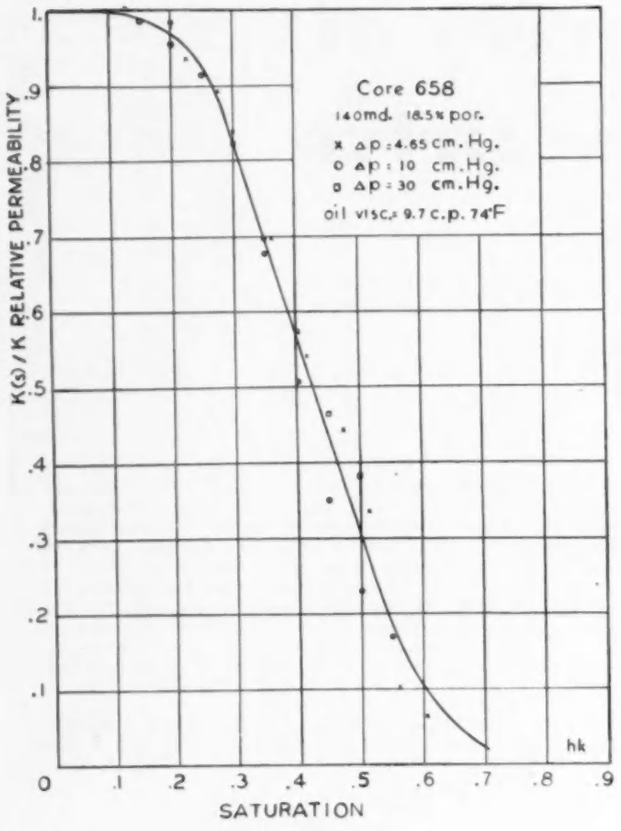


FIGURE 1

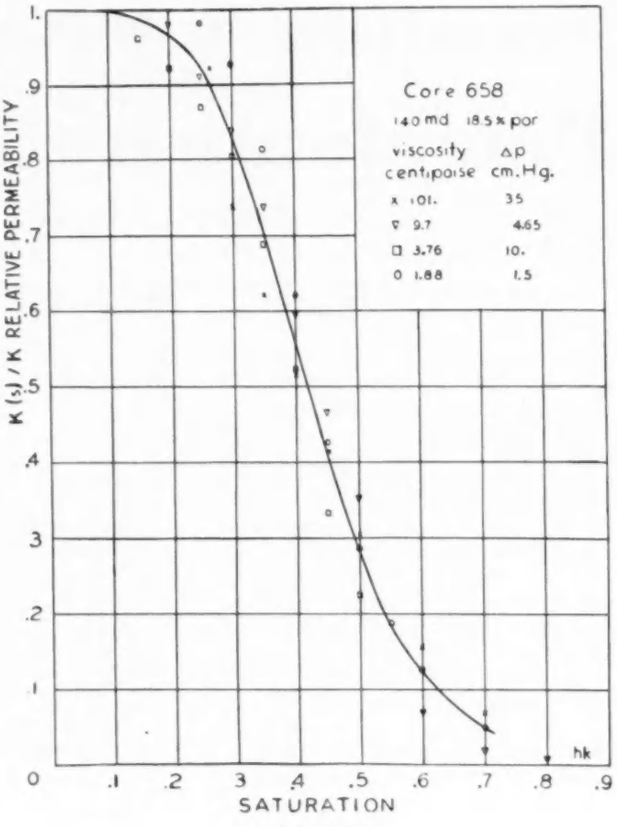


FIGURE 2

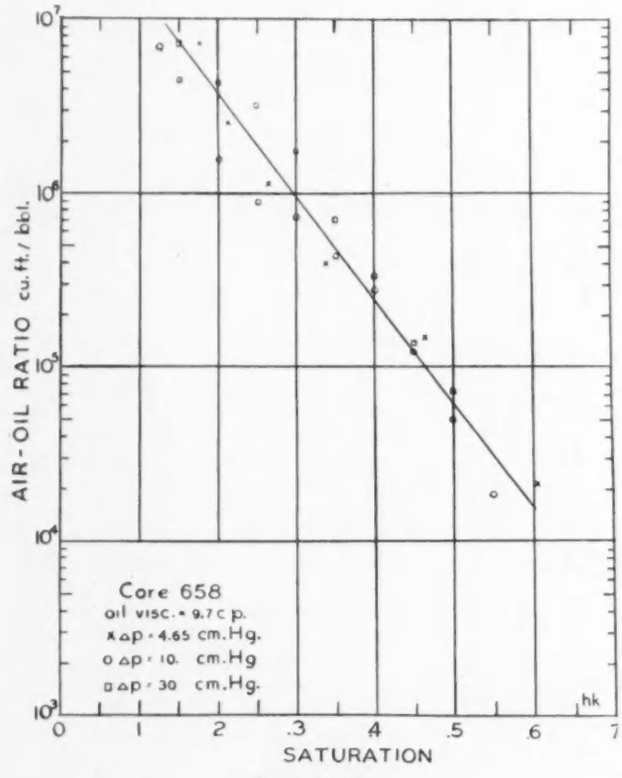


FIGURE 3

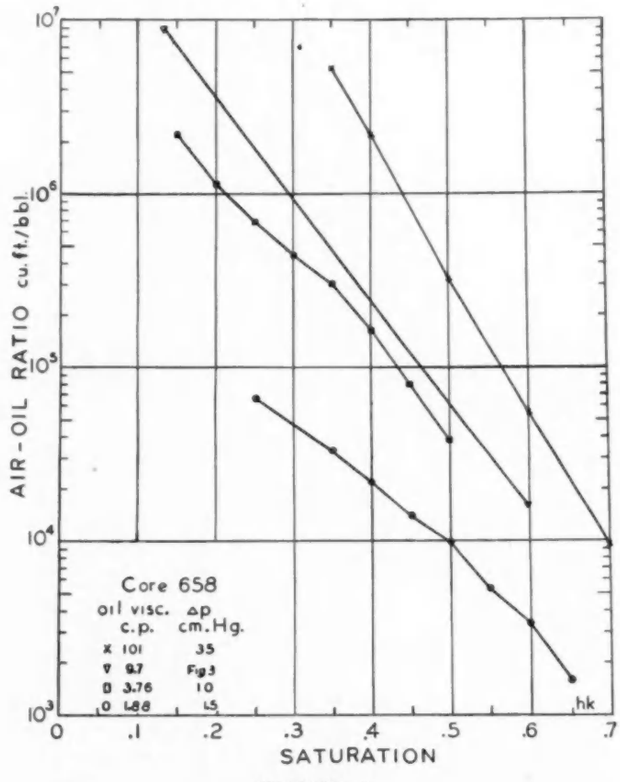


FIGURE 4

TABLE 2

Core	Perm. Md.	Pore Vol.	5.81 c.s. Oil	3.26 c.s. Oil
			Oil Collected cc.	Oil Collected cc.
B8	4.85	22.2	8.45	8.54
H2	20.6	29.0	9.56	11.67
H13	48.8	32.6	10.96	9.57
H9	95	19.4	7.50	6.34
B1	177	44.8	12.07	11.77
B3	235	50.3	13.21	9.76
H18	469	49.7	14.26	11.90
H6	1080	49.9	13.66	17.57

core of permeability 140 millidarcies and porosity 18.5 percent will be used as an illustration. This core showed the poorest agreement of the various cores studied, and, therefore, will best illustrate the validity of the conclusions. Figure 1 shows the variation in relative permeability as a function of oil saturation for four runs at inlet pressures varying from about 5 to 30 centimeters of mercury. The points all lie within a narrow band. Therefore, within this pressure range the relative permeability-saturation relationship is independent of the pressure applied. The relative permeability for oil saturations up to 20 percent is essentially equal to one. This indicates that oil left in the pores of the sand body is retained in the sharp angles between the sand grains, and that 20 percent of the

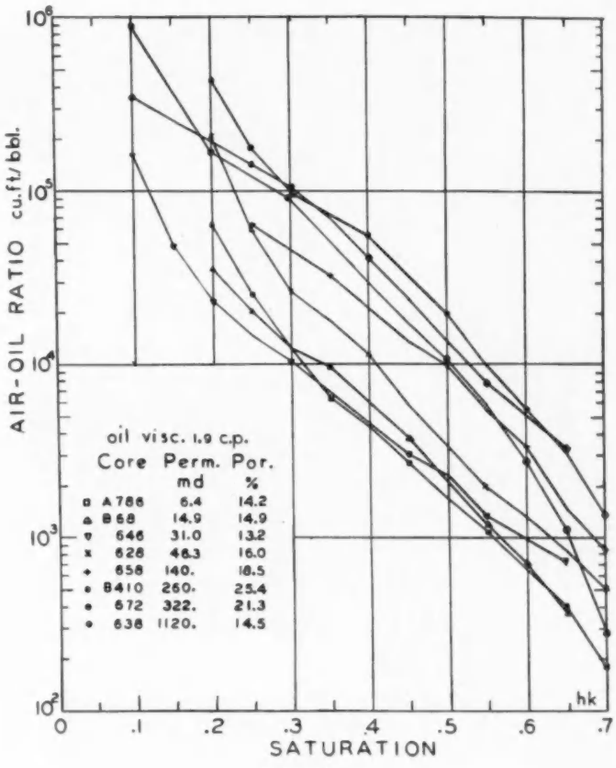


FIGURE 6

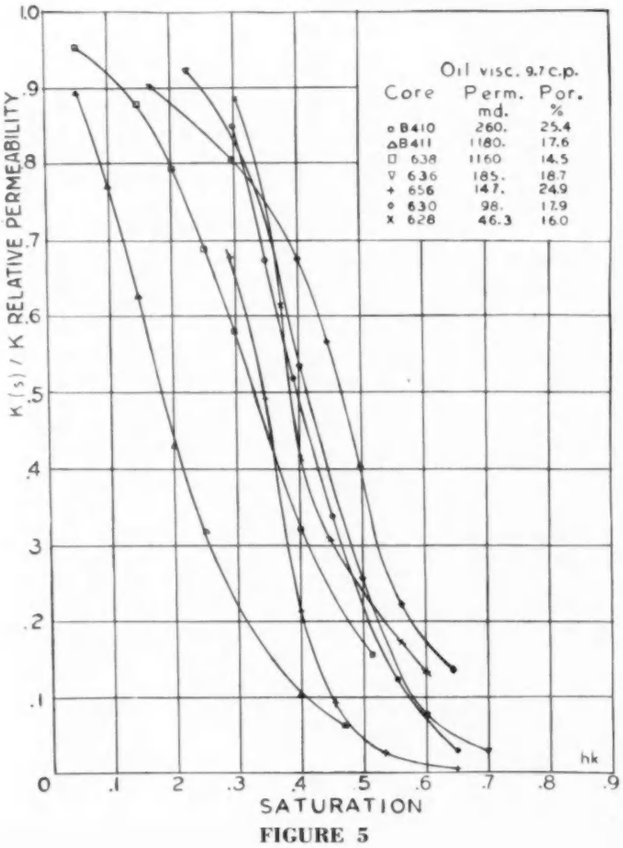


FIGURE 5

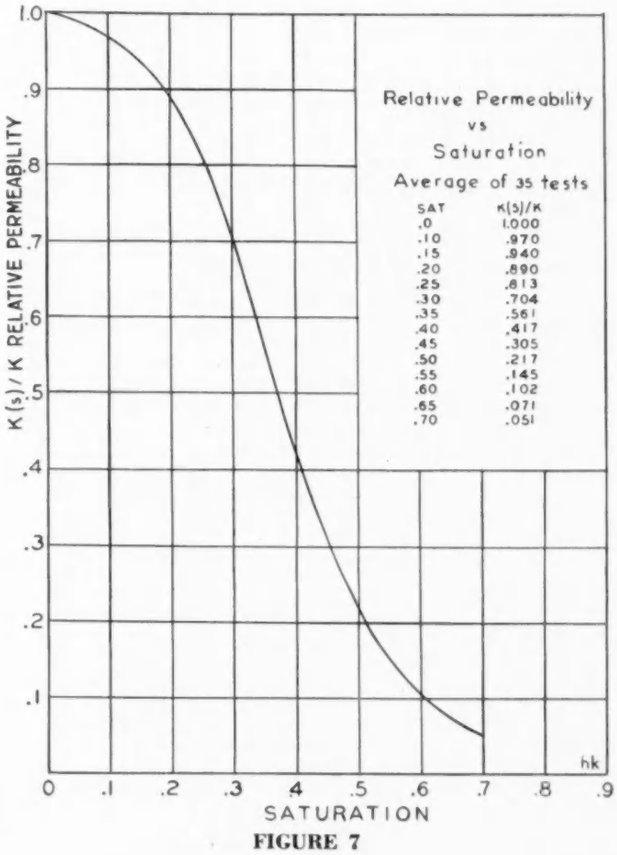


FIGURE 7

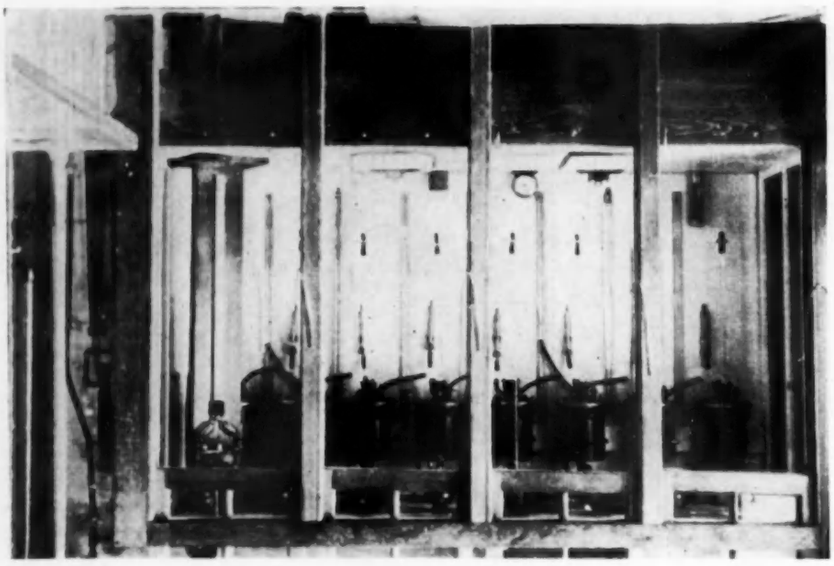


FIGURE 8

Cabinet in which radial cores were subjected to air drive.

TABLE 3

High Pressure Maintenance

Core Number	Oil in Core cc.	Percent Initial Oil Saturation	Applied Pressure cms. Hg.	Oil Collected cc.	Percent Oil Collected		Rate of High Pressure to Stepwise Recovery
					Pore Volume Basis	Oil in Core Basis	
H16	22.0	99.0	60	8.93	40.2	40.6	1.23
H1	23.6	99.6	50	10.36	43.7	43.9	1.62
H19	24.0	98.8	50	12.30	50.6	51.3	1.51
B8	22.2	100	50	10.73	48.3	48.3	1.26
B4	23.8	101.8	60	9.85	42.1	41.4	1.73
H14	27.2	100	60	12.90	47.4	47.4	1.48
H17	21.9	98.7	20	11.94	53.8	54.5	1.31
H20	29.9	98.2	20	16.18	53.0	54.1	1.30
H2	28.9	99.6	30	16.09	55.5	55.7	1.38
H12	37.6	99.3	25	19.22	51.2	51.1	2.40
B6	20.9	98.7	15	12.20	57.5	58.3	1.51
H13	31.9	97.9	18	15.98	49.0	50.1	1.67
H10	31.7	101.0	15	14.58	46.4	46.0	1.95
H9	19.1	98.4	8	11.47	59.1	60.1	1.81
H8	17.5	98.4	8	10.36	58.9	59.2	1.98
1	35.6	99.0	8	19.46	54.1	54.7	2.14
B1	44.0	98.2	8	21.95	49.0	49.9	1.86
B2	38.9	99.5	8	19.50	49.9	50.1	1.90
H11	43.9	97.8	8	22.66	50.5	51.6	1.45
B7	47.6	99.2	8	22.24	46.3	46.7	1.89
4	36.7	98.1	8	21.82	58.3	59.5	1.52
2	35.9	99.2	8	22.70	62.7	63.2	1.56
B3	50.1	99.6	8	23.14	46.0	46.2	2.37
B5	40.2	98.6	8	23.02	56.4	57.3	1.90
H18	49.5	99.6	8	28.00	56.3	56.6	2.35
H6	49.7	99.6	4	25.52	51.1	51.3	1.45
S6	20.3	100.5	3	10.85	53.8	53.7	2.67
H4	20.3	99.5	5	12.16	59.6	59.9	1.74
H5	29.2	97.3	5	16.00	53.3	54.8	2.23
Average Values...	....	99.2	..	....	51.7%	52.1%	1.76

TABLE 4

Oil Drive at 15 cm. hg. Pressure on Initially Water Saturated Core

Core Number	Permeability md.	At Appearance of Oil		At End of Oil Drive	
		Time Minutes	% H_2O Collected	Oil Sat. %	Water Sat.-%
H17	12.1	60	28.2	49.4	48.8
H20	18.8	140	26.9	55.6	43.3
H3	20.6	140	29.5	54.5	44.1
H12	37.9	9.0	21.7	57.9	41.2
B6	40.8	20.8	48.6	47.0	51.6
H10	49.0	4.5	23.1	48.6	50.7
H9	95	2.3	50.	46.4	50.5
1	175	2.17	36.1	49.0	50.9
B1	177	2.5	33.9	48.3	50.8
B2	192	3.42	39.4	47.9	50.6
4	218	1.95	37.4	48.8	51.2
2	224	2.5	51.1	45.5	54.5
B3	235	2.75	37.8	49.2	50.6
B5	256	2.17	38.1	48.2	51.1
H18	469	.63	48.4	48.0	51.7

pore volume is comparatively dead space and, therefore, has a negligible effect on the permeability of the sand. The removal of this 20 percent of oil is essentially an evaporation and entrainment process.

In Figure 2 the result of a series of experiments on the same core with different viscosity oils (2 to 100 centipoises at 25° C.) are shown. It is observed that the viscosity has a negligible effect on the relative permeability-saturation relationship. These experiments lead to the conclusion that the relative permeability has a definite meaning for a given core, and that this relationship between relative permeability and oil saturation is independent of the pressure gradients applied, and the viscosity of the oil used between the saturation range of 0 to 70 percent (pressure gradients from 5 cm. of mercury per inch to 30 cm. of mercury per inch and viscosities from 2 to 100 centipoises). At higher oil saturations this relation may break down. The air-oil ratios for these experiments show a roughly linear relation when the logarithm of the air-oil ratio is plotted on semi-logarithm paper as a function of oil saturation. A small decrease in the oil saturations results in a large increase in air-oil ratio. This relationship is not very sensitive to the pressure gradients applied as is shown in Figure 3. However, the air-oil ratio is affected markedly by the viscosity of the oil as is shown in Figure 4. It is seen that the higher the viscosity of the oil, the higher the air-oil ratio at a given saturation.

An individual core has been the subject of discussion thus far. From current literature one obtains the idea that the relative permeability as a function of saturation is a fundamental property of all cores. That this idea is eroneous is evident from Figure 5. Here the relative permeability for a number of cores is shown. It is at once clear that different cores have different relations and that this relation is not uniquely tied up with the specific permeability of the core. In other words, the relative permeability - saturation relationship is an individual characteristic and two cores of equal permeability may have different relative permeability versus saturation relationships. Likewise, it will be observed in Figure 6 that different cores have different air-oil ratios at a given saturation. For comparison purposes it would be conveni-

ent to have an average relative permeability - saturation relationship. Such a curve is obtained by averaging the results of 35 experiments on Venango cores as shown in Figure 7.

The small cores used in the above experiments are not suitable for determining actual oil recovery. Diamond-drilled cores from the Venango district were, therefore, obtained for recovery studies. These cores are cylinders approximately 3 inches long and 2¼ inches in diameter. A hole of about ¾ inch in diameter is drilled perpendicular to the bedding plane through the center of the core so that a radial system results. The advantage of such a core is that it will hold roughly 30 cc. of oil when fully saturated (depending on the porosity and bulk volume of the core), and consequently the oil recovered by means of an air drive can be collected and measured. The core after being saturated is mounted in a holder and air pressure is applied to the outside of the core. The oil is collected in a graduate, and the rate of flow is obtained by means of a flowmeter capable of reading flows varying from .001 cc. per second to 35 cc. per second. The oil used in the experiments to be described was a close-cut oil of viscosity 3.26 centistokes and density equal to .8046 g. per cc. at 25° C. The cabinet in which these radial cores were subjected to air drive is shown in Figure 8. Each holder has an individual pressure control and consequently 8 different runs may be performed at the same time.

The first fact noticed in experiments with these cores was that a definite pressure had to be applied to a fully saturated core before any oil would be produced. This pressure, following the terminology of Yuster in water flooding (Yuster, S. T., Proc. First Technical Meeting, Bradford Research Group), will be called the *threshold pressure* of the core. The qualitative reason for a threshold pressure is fairly simple. Because of the surface tension at an interface a definite pressure must be exerted in order to remove oil from a given size capillary. In general, a core of high permeability will have larger size capillaries than a lower permeability core. Consequently, one should expect that higher permeability cores would require smaller pressures in order to start the oil moving than is the case for lower permeability cores. The threshold pressures obtained for a number of cores are shown in Figure 9 as a function of the permeability of the cores. The relationship on log-log paper can be approximated by a straight line for permeabilities less than 1000 millidarcies. The equation expressing the relation of threshold pressure (P) in cm. of mercury as a function of permeability (K) in millidarcies is

$$P = 18.2K^{-.313}$$

Although the results are expressed by this equation, the range of experimental points should be carefully noted. This distribution must be tied up with the capillary size distribution in the core and will depend mainly on the largest sized channels. Semiquantitatively, then, one can say that increasing permeabilities means lower threshold pressures.

Following the same line of reasoning, one can see that at a given pressure only a certain amount of oil will be removed, depending on the number of capillaries of the correct size. This is exactly what happens when the following experiment is performed: A core is fully saturated with a close-cut oil. The core is then mounted in the core holder and subjected to air pressure. The pressure is increased in steps of one cm. of mercury, each increase being made after no additional oil is collected at that pressure. In the illustration shown in Figure 10 it is observed that no oil was collected until the threshold pressure was reached (in this case about 10 cm. of mercury). At each increment of pressure an added amount of oil was collected until at a pressure of 21 cm. of mercury no further oil could be collected. The shape of this curve will vary from core to core depending on the pore pattern of the core. Of course, more entrained oil could be captured if the air drive were allowed to continue. It will also be observed that the total amount of oil collected was only 33 percent of the total original oil in the core. This result is indeed typical of the 29 cores studied (see Table 1). Recoveries varied from 19.4 to 41 percent with an average recovery of 30.5 percent. This recovery is very low considering the fact that the cores were originally 100 percent saturated with oil. We will consider this fact in more detail when we discuss the effect of connate water content on the recovery of oil.

In the experiments with small cores it was shown that oil viscosity did not effect the relative air permeability-oil saturation relationship but that it did effect the air-oil ratio. The higher the oil viscosity the higher the air-oil ratio, i.e., more air is required at a given saturation to recover a barrel of high viscosity oil than of a low viscosity oil. The viscosity of oil is, therefore, an important factor in determining the rate of recovery of oil and the amount of air necessary to recover that oil. However, the question as to whether higher viscosity oil means lower ultimate recovery is not answered. In order to get an answer to this

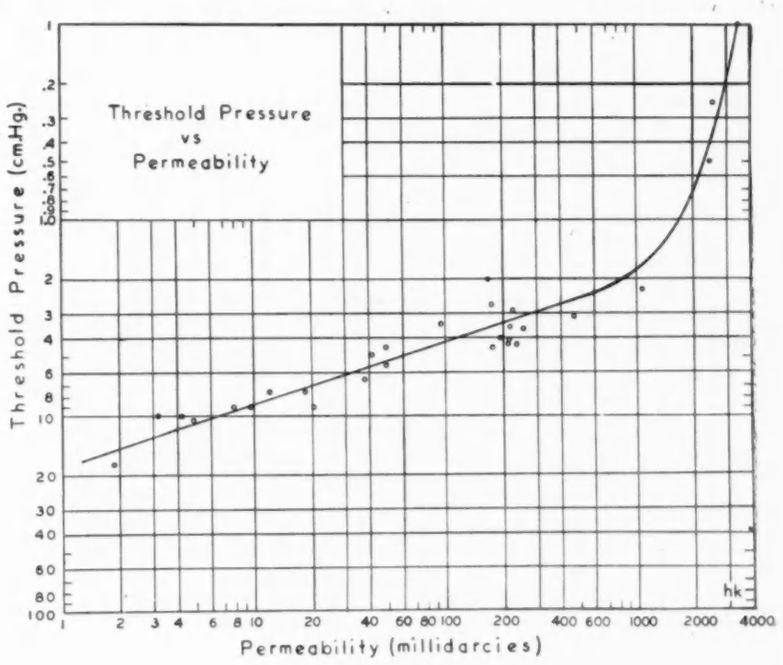


FIGURE 9

question 8 cores used in the previous stepwise experiments were saturated with a close-cut oil of viscosity 5.81 centistokes and density .8200 grams/cc. at 25° C. This is a 1.8 fold increase in viscosity. The stepwise pressure increase method was then applied. Table 2 shows the yields obtained for the 3.26 and 5.81 centistoke oils.

Upon examining these data, it is observed that in five cases more oil was collected when higher viscosity oil was used. This appears to be quite disturbing since it was expected that the lower viscosity oil would show the greater recovery in every case. If we examine the data we find that in the case of the lower viscosity oil that the oil was forced out more rapidly with the resultant effect that more air went through the core and consequently more entrained oil was captured in the charcoal receivers. The whole question of yields is intimately bound with the question of the rate of flow of the air and how the channels in the core are first cleaned out. Due to the natural variability in these factors, the results obtained from such experiments can only be interpreted on the basis of averages. It would seem from these experiments that the viscosity of the oil played the important role of telling how rapidly certain channels are cleaned out, and, therefore, determines the amount of air channeling. It is obvious that we do not have sufficient data to settle the question as to whether or not more oil is recovered with lower-viscosity oil. We can simply state that it does not appear that the viscosity of the oil (within limits) is the determining factor in the recovery of oil by air drive, as far as total ultimate recovery is concerned.

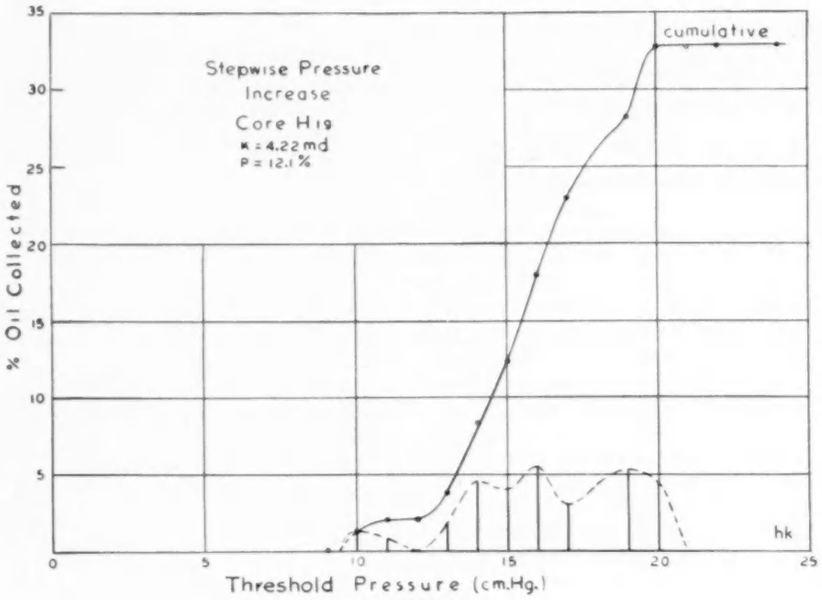


FIGURE 10

The next step which follows from this series of experiments is to determine the value of applying a high pressure and maintaining it. If a pressure is applied slightly higher than the maximum pressure (at which oil ceased flowing) used to collect oil in the stepwise experiments, we find a decided increase in recovery. The use of a constantly maintained high pressure on a 100 percent saturated core leads to a recovery of about 52 percent (based on 29 cores with a variation from 41 to 63 percent. See Table 3). The comparison between the stepwise pressure method and the high pressure maintenance is illustrated in Figure 11 where the percent recovery is shown as a function of the permeability of the cores. There is no simple correlation between recovery and permeability of the sand. The recovery for the high pressure maintenance (based on 29 cores) shows an average recovery of 1.76 times that obtained by stepwise pressure increase (1 cm. mercury presssure steps). The lowest ratio was 1.23 and the highest 2.67. Consequently we deduce from this evidence that the use of an immediate high presssure is greatly preferred over the use of a low pressure gradually increased in steps, since both larger and faster recoveries result.

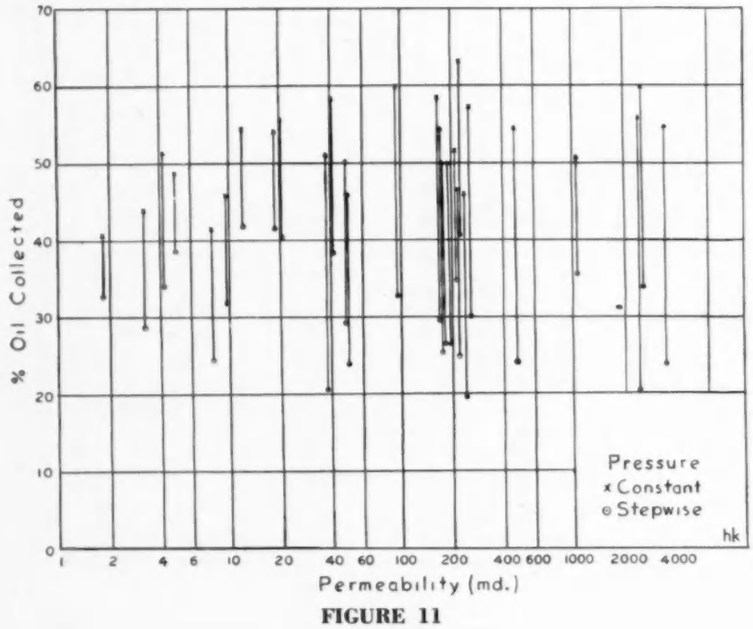


FIGURE 11

There is one other conclusion that should be emphasized. It can safely be stated that a core with 30-percent-oil saturation will show no recovery when subjected to an air drive. However, field experience indicates that oil may be recovered from properties with 30-percent-oil saturation. The only solution to this contrast between the laboratory results and the field evidence must, therefore, lie in the fact that the laboratory has not considered all the variables. The clue to the difficulty must lie in the failure to take into consideration the connate water content of the actual oil sand.

Experiments on cores partially saturated with oil and water followed. The procedure for preparing these cores for these experi-

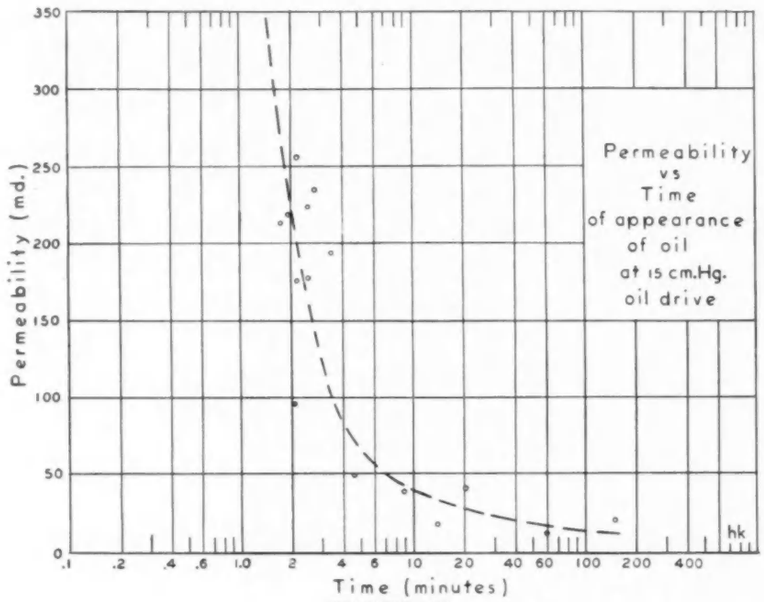


FIGURE 12

ments was very simple. The core (properly extracted) is first placed in a vacuum chamber in order to remove the air. Distilled water is then introduced to saturate the core. The core is then placed in a holder and oil is forced through the core, removing a certain percentage of the water. This method is perhaps similar to what must have happened in the oil fields where salt water was partially replaced by oil.

This method of loading, results in water being retained in the small capillaries and interstices, whereas the oil is in the larger openings. The method allows one to obtain a fairly accurate material balance, with the highest accuracy occurring in the cores having the largest pore volume. Nine cores were prepared in this way. These cores had water saturations ranging from 35 to 48 percent, averaging 42.4 percent and the oil saturations varied from 51 to 62 percent averaging 56 percent. Air drive, using stepwise pressure, then was applied. The first feature noted was that the threshold pressure was slightly higher, but within the experimental error of determining the threshold pressure. The water in the core does not, therefore, appreciably effect the magnitude of the threshold pressure. This is in agreement with the qualitative discussion given above for the threshold pressure. Likewise, no water was collected in the air drive. The recovery agreed well with that obtained by using a 100 percent oil saturated core. In five cases the oil collected from the completely saturated cores was greater than the amount collected from the partially saturated core; and in four cases the amount collected from the partially oil-saturated core was greater than that obtained from the completely saturated core. In other words, with stepwise pressure application, as much oil will be recovered if we start with a 42 percent- and 56 percent-core (on the average) as will be obtained from a core initially 100-percent-oil saturated. Of the amount of oil in the partially saturated core 51 percent is collected, but on a 100 percent fluid basis, only 30 percent is collected. The importance of an analysis of the connate water content of a core for the purpose of estimating the recoverable oil is, therefore, of paramount importance.

In order to get a better picture of the oil-connate water relationship, 16 cores were saturated with water and then subjected to an oil drive at a constantly maintained pressure of 15 cm. of mercury at the outside of the cores. The water driven out as a function of time was observed. In the case of permeabilities less than 40 millidarcies it was not possible to collect 50 percent of the water originally in the core at a pressure of 15 cm. of mercury. The time of first appearance of oil and the percentage of water collected at that time was recorded as it serves as an indication of the uniformity of the pore pattern of the cores; the higher the percentage of water driven out before the appearance of the oil, the more uniform the pore pattern of the important channels in the core. Table 4 gives the results for the time of first appearance of oil. It will be observed that the percentages of water collected, at the time of first appearance of oil, varied from 23 to 51 percent of the total initial water content. In Table 4 is included the final oil and water saturations at the completion of the oil drive.

If the permeability is plotted versus time required to produce 30 percent of the water (20 percent or 40 percent), the data give the following results: for high-permeability cores, the time is very small and with decreasing permeability the time increases very rapidly. However, there is quite a fluctua-

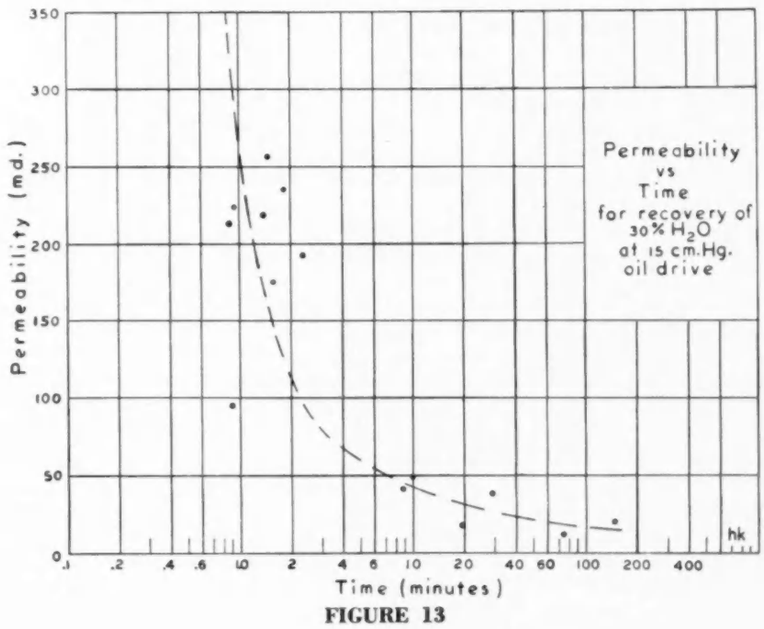


FIGURE 13

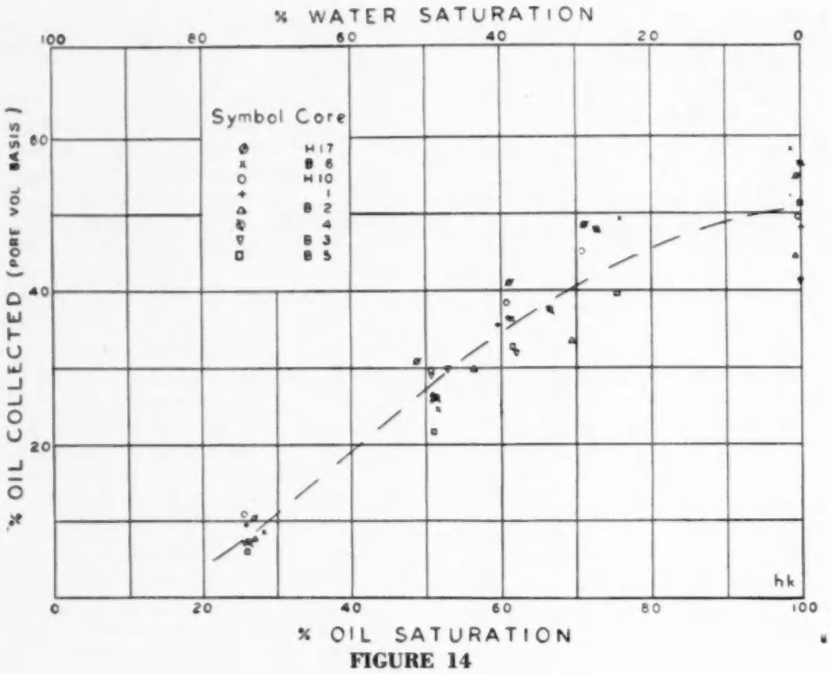


FIGURE 14

tion in the data as may be observed in Figure 12 in which the permeability as a function of the logarithm of time for 30 percent recovery of water is plotted. The fluctuation of points is again tied up with the pore pattern of the cores. The 20-percent-recovery curve would lie to the left of this and the 40-percent-recovery curve to the right. The curve for the permeability versus logarithm of time of first appearance of oil is very similar to Figure 12 and is shown in Figure 13.

This experiment indicates that when water was replaced by oil many years ago, if the oil migrated under a constant pressure head, the higher-permeability cores retained a smaller water content than did the lower-permeability cores. If these experiments performed at one pressure are indicative of experiments performed at different pressures, then one would expect to find upon analysis that higher-permeability cores in general have a smaller percentage (basis: total volume available) of connate water than the lower-permeability cores. Of course, the uniformity of the pore pattern will play an important role in the fixing of the percentage. Likewise, the smaller time required for the oil to break through the higher-permeability sands might well lead to by-passing, leaving portions of the sand with more than the normal water content.

Eight cores varying in permeability from 12 to 256 millidarcies were prepared in a manner similar to that discussed above. Varying percentages of oil and water content were used. The cores were subjected to an air drive at constant pressure so that the data, shown for a given core, are based on recovery at a constant high pressure. The result of such a series of experiments is shown in Figures 14 and 15. In Figure 14 the percent oil recovered at constantly maintained pressure is plotted as a function of the original oil and water saturation which add to approximately 100 percent. The percent recovery is based on the total fluid in the cores. It will be observed that each core has the same general trend. Another interesting manner of plotting this data is shown in Figure 15 in which the oil recovered, calculated on an oil in the core basis, is shown as a function of the original oil and water saturation. It is observed that this curve passes through a maximum which varies for different cores. This maximum roughly occurs in the region of 30-percent-water saturation.

Let us now return to the question of oil recovery. It is now evident that the connate water concentration and its distribution in the pores plays a controlling part in the amount of oil recovered. A core can produce oil even though the oil saturation is as low as 30 percent, if connate water is present. This is due to the fact that, although there is only 30 percent oil, it is contained in the larger size capillaries and the connate water is in the smaller capillaries. Consequently, the factor that determines oil recovery to a large degree is the connate water concentration. So it is, therefore, very important in a core analysis to determine the connate water content as well as oil saturation for recovery estimates.

The writer wishes to thank R. J. Day for his assistance in a large portion of the experimental work, and the Pennsylvania Grade Crude Oil Association for its sponsorship of this project.

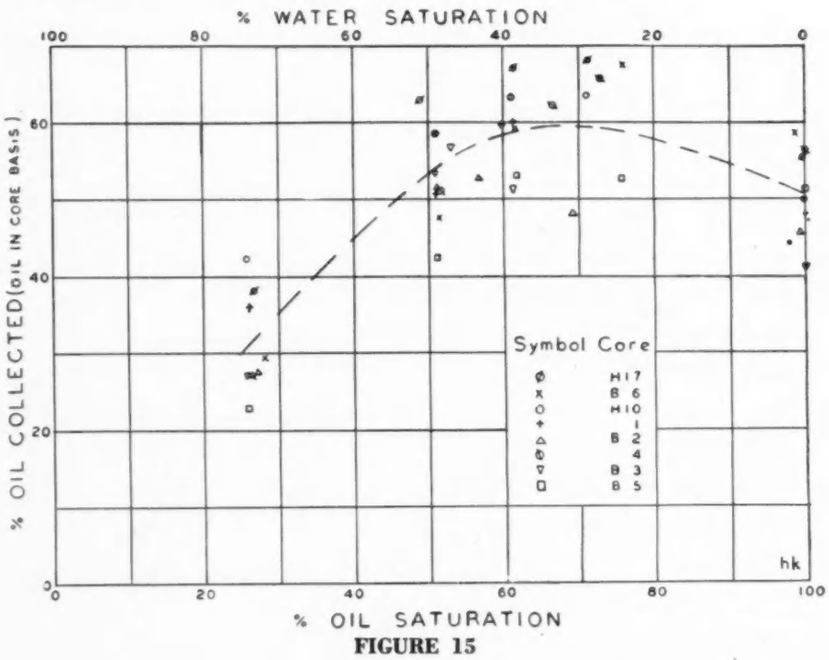


FIGURE 15

Economic Selection of

Oil Field Equipment

Part 2

Effect of Reservoir Performance on Required Equipment Capacity

By EMORY N. KEMLER
Associate Professor, School of Mechanical Engineering, Purdue University

NOW more than ever before, due largely to the more critical economics developed by prolongment of the investment payout period because of production curtailment, the selection of equipment must be considered carefully if operations are to result in profit.

This is the second of a series of articles that will discuss various factors influencing the overall cost of equipment. The series has been prepared especially with the practical oil man in mind, all but the most necessary fundamental mathematics being eliminated, and in every case where it was felt such were required the final result has been reduced to an easily understandable and practical chart.

WITH a fixed set of future producing conditions it would be possible to arrive at a definite equipment program best fitted to a specific situation. Unfortunately, these conditions are not given here but must be determined in each instance. The problem of predicting the producing history of a new well is the most difficult of the many problems of equipment selection. It requires among other things some information on the future history of the reservoir. Since a "crystal ball" is not generally available for such problems the engineer must apply general information on reservoir behavior to such specific data as he may have on the actual well.

From the standpoint of production equipment programs, reservoirs might be divided into (1) water-drive reservoirs, (2) gas-drive reservoirs, (3) combination water- and gas-drive reservoirs and (4) artificial-drive reservoirs. Each has somewhat different general requirements.

Water Drive Reservoirs

In a water-drive reservoir the producing formation is connected by a permeable formation to a source of water. This origin of water normally being some surface source where the formation outcrops. Figure 1 shows schematically one possible manner in which water may be supplied to the reservoir. The permeable formation connecting the oil-producing reservoir or part of the formation and the source of water is in effect a material pipe line which carries the water from its beginning to the point where fluid is withdrawn from the reservoir. The pressure available to force the water through this natural pipe-line system is the head of water itself since the formation is open to the atmosphere. The amount of fluid which can be put through a pipe line is dependent on the pressure available to force it through the system, on the length of the line and on frictional resistance in the carrier. Similarly, the amount of water which can flow in an oil reservoir will depend on the available head, the distance along the formation to the source of the water, and on the resistance of the formation (its permeability and thickness). These latter two factors correspond to pipe roughness and diameter in a pipe-line system.

In such a reservoir it can be seen that what happens to the pressure will depend on the rate at which oil or water is withdrawn from the reservoir and on the resistance of the formation carrying water to the reservoir. If the formation has a high permeability and the withdrawal rate is small, the bottom-hole static or reservoir pressure will remain essentially constant. Under these conditions, for reasons to be discussed later, the wells probably will have a constant capacity to produce throughout their life. Under such conditions, pumping equipment must be purchased to take care of the maximum production rate. For a water-drive pool this will be near the end of the life of the equipment, since at that time the well will make a large percentage of water and much fluid must be handled to produce a given amount of oil.

To illustrate the conditions encountered and to serve as an example for later calculations Figure 2 has been drawn to show how a water-drive well might be expected to perform. Such a typical well would be expected to produce only oil for a time, after which an increasing percentage of water would have to be handled. It is assumed that no gas is present either as free gas or as gas in solution in the oil. The shape of the decline curve or oil percentage versus cumulative oil production or recovery would depend on the reservoir and the fluids being produced. The method of production might also influence the shape of the decline curve. For simplicity, it has been assumed that the typical decline of oil

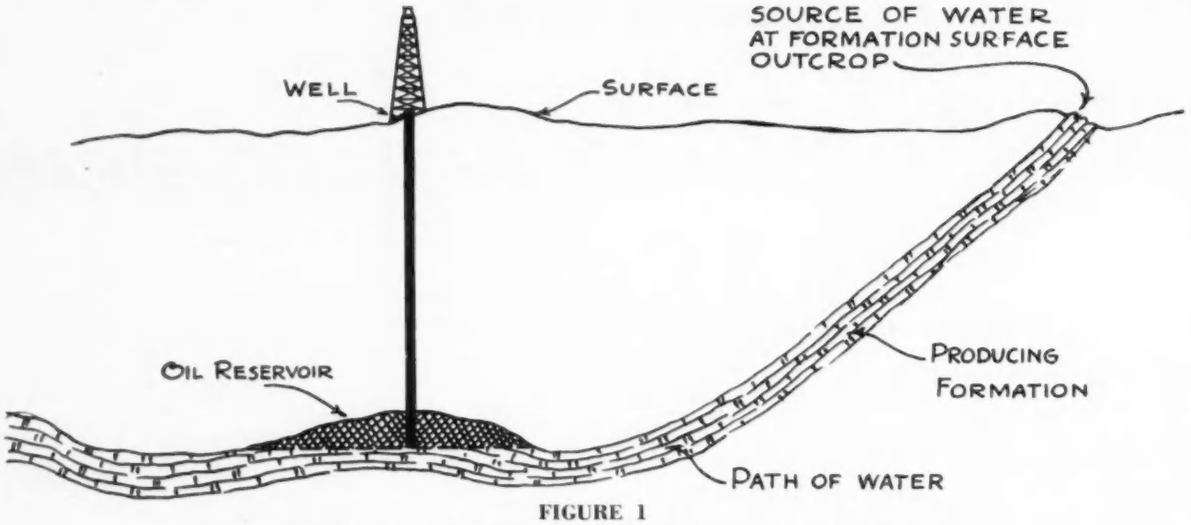


FIGURE 1

Schematic illustration of one possible manner for creation of water drive.

percentage or increase in water percentage will be or can be approximated by a straight line for a major portion of the well's history. It has been assumed for purposes of illustration that the later life of the well will be characterized by a slowly declining percentage of oil. This decline curve or well-life-history curve is very important in determining the equipment policies and the final answer will depend on the shape of the curve.

From Figure 2 then can be constructed curves showing the total fluid which must be produced to provide a given oil production at any part of the well's life. To illustrate how the total fluid varies Figure 3 has been constructed. In this figure it can be seen that as the percentage of oil decreases, the amount of fluid which must be handled increases rapidly. These curves have been stopped at 1000 barrels of total fluid per day, since this is about the practical capacity of 3-inch tubing. When this limit is reached the amount of oil which can be produced per day will decrease. The shape of the curves after this point are critical with regard to the shape of the decline curve during its later history. For the illustration shown the well would be able to produce over 5 barrels per day for a considerable period. This is probably an optimistic estimate for an average well and should not be considered as a typical case. Each type of formation must be considered on its own merits and may vary considerably.

It should be pointed out that the above curves are based on the assumption that the well has a capacity to produce which is in excess of 1000 barrels per day and that the capacity of the well remains above 1000 barrels per day throughout its life.

Gas-Drive Reservoirs

In a gas-drive reservoir the oil is produced by the gas coming out of solution, causing the oil to be produced by displacement. Expansion of a gas cap or the formation of a gas cap when the pressure is reduced will also cause displacement of the oil. In such a reservoir the formation has been isolated in some manner and there is no outside source of energy. The reservoir pressure for such a well will

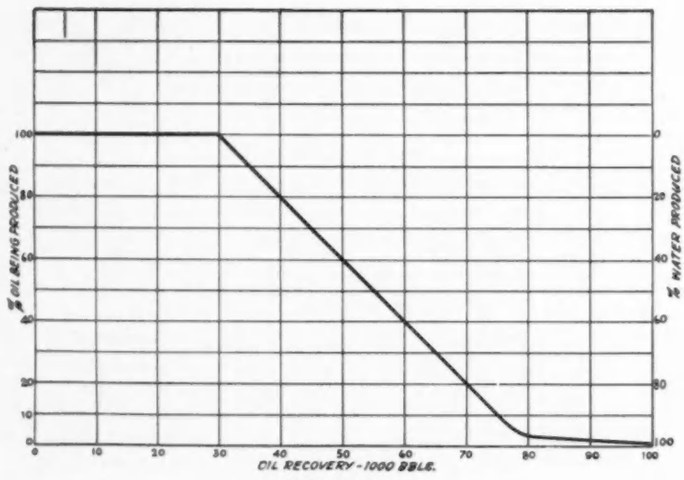


FIGURE 2

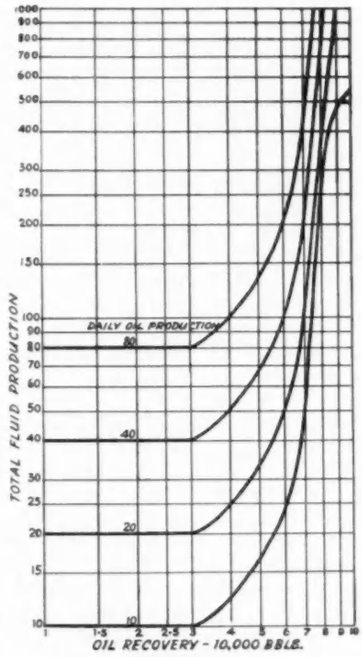
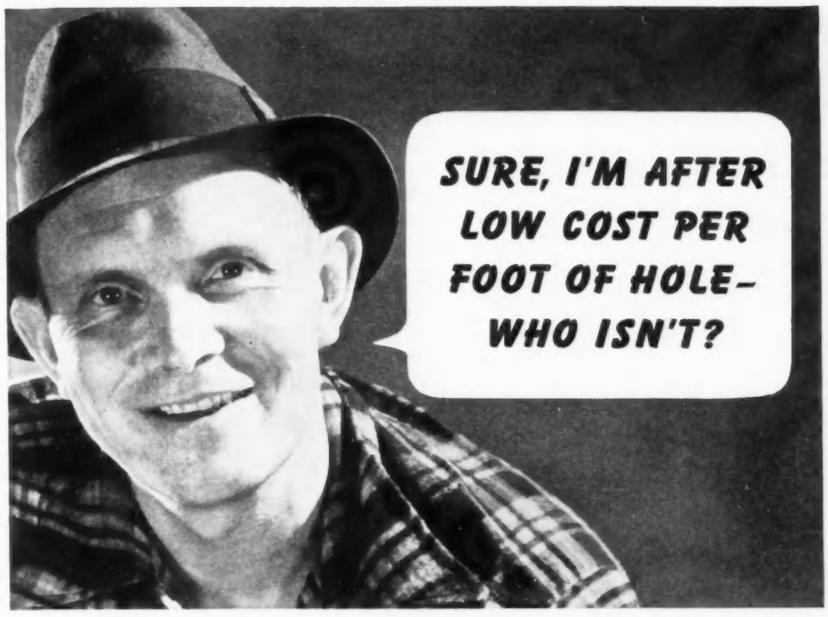


FIGURE 3



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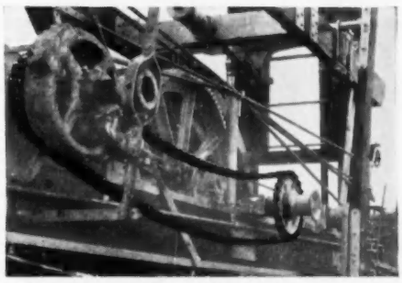

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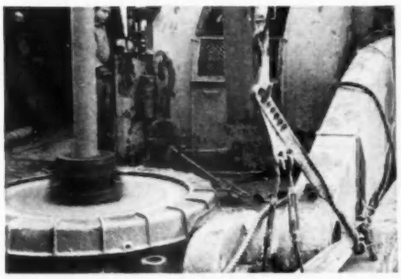

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⑤ WHEN YOU BUY Rex oil well chains, you're buying the benefits that come from Rex's close contact with men like you, since the earliest days of drilling! Rex oil well chains have always been the standby.

⑥ HE CALLED ME BACK after he'd used his first Rex oil well chains. "Say," he said, "the records have just come in, and I find that Rex has given us a real dollars-and-cents savings."

P.S. *Don't forget Rex roller chains! Available in single or multiple width strands, they're an oil field standby for high speed, "slim hole" drilling! Rex Roller, Rex Champion, Rex Deepwell, Rex Standard and Rex Universal (in single and double strands) cover all oil well drilling needs. Ask your local supply dealer about them, or write directly for complete information. Address 1639 West Bruce Street, Milwaukee, Wisconsin.*

REX OIL WELL CHAINS

CHAIN BELT COMPANY OF MILWAUKEE

Baldwin-Duckworth Chain Belt Division, Springfield, Massachusetts • Worcester, Massachusetts
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50th ANNIVERSARY 1891 REX 1941 CHAIN BELT COMPANY

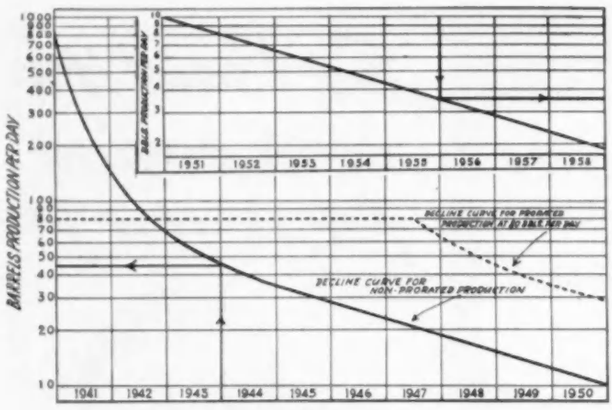


FIGURE 4

show a continued pressure decline. Figure 4 shows a hypothetical decline curve which might be obtained from such a well. On this diagram two types of curves have been drawn. The solid line represents the decline curve which would be obtained under non-prorated conditions. In this case 18 years are required to deplete the well to a production rate of about 2 barrels per day. In the case of prorated production a curve similar to the dotted line would be obtained. This curve has been drawn on the basis of an allowable production of 80 barrels per day. In this case 6½ years will elapse before the allowable production reaches the value which would be attained under non-prorated conditions after about 1¾ years. From this time on the production rate is assumed to be the rate which would be procured on the non-prorated decline curve. The time for the production to reach 30 barrels per day is 5 years longer under the prorated conditions than under non-prorated conditions.

Under prorated conditions for the example shown, the maximum equipment requirements will be those required to produce 80 barrels per day from the bottom of the hole. The total requirements for load and power under these conditions would be largely dependent on the amount of energy available from the gas being produced with the oil.

A combination gas- and water-drive well will fall somewhere between the gas-drive and the water-drive types of pools. If the water drive is not pronounced there will be a rapid initial pressure decline and, therefore, a rapid reduction in the well capacity. As this pressure drops, the water inflow will increase until some sort of equilibrium is eventually reached. If this water comes in as edge water, and providing the producing sand was initially uniformly saturated with oil, the water will act as a water drive and the behavior of individual wells will depend on the manner in which the water approaches them. A well of this type would be expected to make increasing percentages of water. The total fluid to be handled would, of course, be dependent on the rate at which water was being fed into the reservoir. In an extreme case, such as East Texas, the part of the field being adjacent to the water drive behaves essentially as a water-drive field, whereas, that most distant behaves as a gas-drive type of field with a delayed decline. In this case because of the restricted withdrawal rate the water drive keeps the reservoir pressure from dropping as rapidly as it would under gas-drive conditions alone.

For this set of conditions the equipment requirements under prorated conditions would be greatest at the end of the life of the well. Under non-restricted producing conditions the requirements will depend on the effectiveness of the water drive and how long the well will continue to flow. Because of the wide variations in operating conditions it is difficult to draw general conculsions unless some specific set of data be available or assumed.

Artificial-Drive Pools

Both primary pressure control and secondary methods of recovery can be listed under the heading of artificial drive. In the case of a repressuring project the equipment requirements will be essentially similar to those near the end of a gas-drive project. For a water-flooding project the equipment requirements will depend on the manner in which the water flood is operated. For example, if a delayed water flood is used and rate of production properly controlled, the oil may be produced without use of lifting equipment. In this case power will be supplied at the water-input station. In case the wells are pumped the power requirement will be considerably greater than for the gas-drive operation. The amount of increase depending on the rate of water injection, effective permeability of the formation, etc.

For the case of primary pressure control, i.e., where gas is reinjected into the formation before the reservoir pressure has declined appreciably, the result will again be dependent on local operating conditions. So long as the reservoir pressure is above that value required to maintain a flowing well at the required production rate, the production can be obtained by natural flow. For a gas-drive field this will mean that a large percentage of the production can be obtained by flowing and that the final production which will be obtained by secondary recovery methods will be reduced.

In case primary pressure control or pressure maintenance by the injection of gas is applied to a combination water and gas drive, a condition might arise where all the production could be obtained by natural flow. Here again specific data are required for reaching any specific conclusion.

The East Texas field offers as good an example of the performance of an oil reservoir as any other pool. Relatively complete data are available on pressures, properties of the fluid, etc., so that a general-

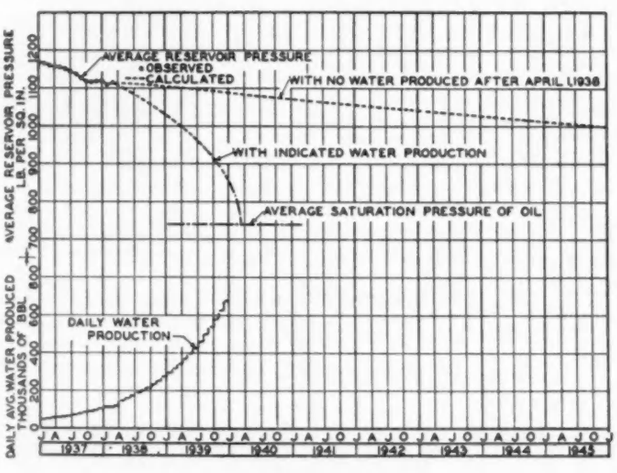


FIGURE 5

Calculated effect of water production on reservoir pressure—East Texas field.

Before you complete your present well—consider the advantages of

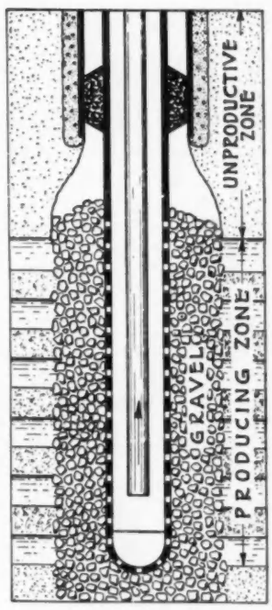
Gravel Packing by Circulation

OIL PRODUCTION from unconsolidated and fine sands presents certain difficulties, including sand cutting of screens or perforated liners, the sanding up of flowing wells, and inordinate wear on pumping equipment due to the abrasive action of the sand carried by the oil.

Producers who face this problem will find that gravel packing by circulation offers protection with many practical advantages.

Only by this method can the thickness and character of the gravel pack be varied to match the character of the sand and oil encountered. The gravel pack, through its contact with the sand, holds it in place and prevents its movement.

No lower cost method as fully effective has as yet been devised. The need for expensive screens and liners is eliminated. If ever necessary, the ordinary perforated liner used in this method could readily and easily be extracted and replaced.



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One 16 oz. can of Sand-Banum protects a 250 hp. boiler for one month . . . just use a few ounces weekly.

So when you finish one job, just take the handy 16 oz. can to the new location. Sand-Banum cans have a safety-tight seal cap.

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STRIPS wire line clean

Automatic
Compact
Safe
Refillable

For service on producing wells where gas and high gravity oil are encountered, Patterson-Ballagh Style B Wire Line Wiper is highly recommended. This style comprises a steel housing and easily replaceable one-piece rubber refill. The housing is neatly hinged. The rubber is spirally-wound and wipes the line cleanly. Equipped with hold-down chains and safety release.

See Composite Catalog

PATTERSON-BALLAGH
WIRE LINE WIPER
PATTERSON-BALLAGH CORPORATION
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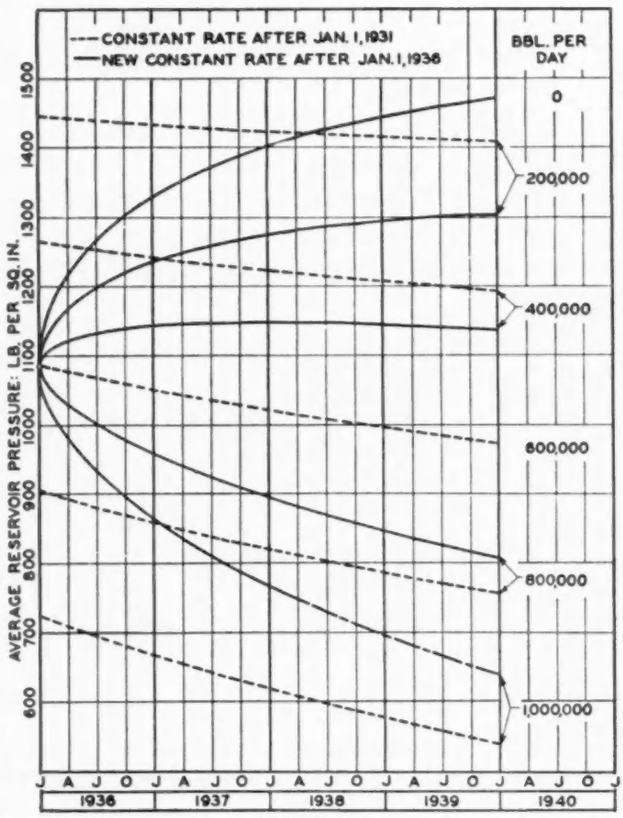

FIGURE 6
Calculated effect of variation of production rate on reservoir pressure—East Texas field.

ized analysis is possible. In this case the withdrawal rate is higher than the water volume supplied to the reservoir so that there has been a decline in pressure. Buckley [1] has shown a number of curves based on the performance of this field which illustrates very clearly the many factors involved in studying reservoir performance. Figure 5 shows the effect of water production on reservoir pressure based on data available at that time. These calculations illustrate the hazards in making such calculations in that the daily water production must be known or be assumed before other calculations can be made. The pressure decline curve will then be no more accurate than the predicted water curve. Figure 6 shows Buckley's calculated effect of varying the production rate of the reservoir pressure. In case the production rate is reduced the bottom-hole pressure would increase.

As has been discussed in this article, the withdrawal of water from the reservoir has as much effect in the pressure as has the withdrawal of an equal volume of reservoir oil. The general study of reservoir performance is important and is deserving of much attention. The discussion as given here has not been detailed or complete. An attempt has been made only to cover generally the problems involved and to show the need for knowing something about how the reservoir will perform before equipment that will fit the well can be selected. The closer reservoir performance can be predicted, the smaller will be the factor of safety necessary in the selection of equipment.

The next installment of this series [to appear in an early issue] will discuss the use of reservoir data in determining well capacity.

[1] The Pressure Production Relation in the East Texas Field by Stuart E. Buckley—A.P.I.—1938.

GULF ANTI-FRICTION GREASE

GULF PRECISION GREASE

. . . . FOR BETTER LUBRICATION OF BALL AND ROLLER BEARINGS

WITH machines required to run continuously for longer periods each week, improved lubrication is necessary for better defense against sabotage by friction. To better protect ball or roller-bearing equipped units, Gulf has developed two new greases—Gulf Anti-Friction Grease, recommended for heavy-duty service—and Gulf Precision Grease, for lighter duty and higher speeds.

Both have a comparatively high melting point and are specially prepared for greatest resistance to oxidation and separation.

Gulf's newly developed method of compounding, employing special high-pressure kettles and mixing methods, produces these greases with a relatively smooth, non-fibrous texture, which will undergo a minimum of change in consistency in service.

A wide range of standardized consistencies is available for any method of application or operating condition. Write today for complete information.

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Please send me without obligation complete information about your new long life greases for anti-friction bearings.

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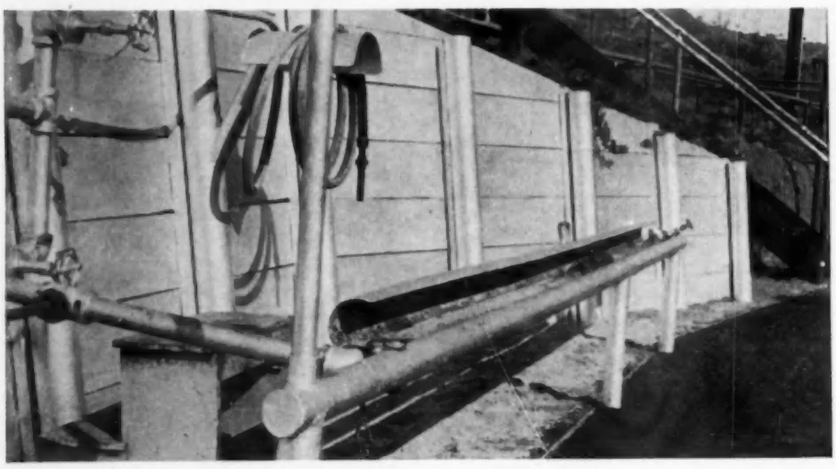
Practical Operating Hints for

1. EQUIPMENT CARE

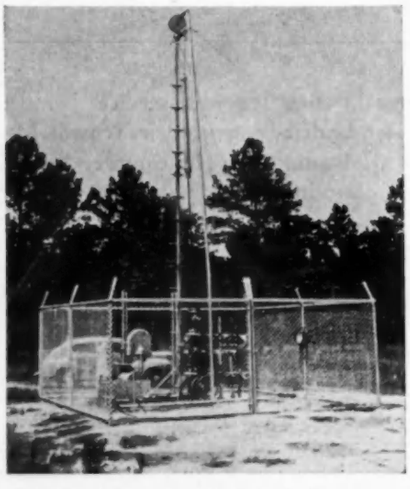
Hose at Truck Loading Rack Protected by Shield Fashioned from Well Casing



The hose at this natural gasoline loading rack is protected against the sun's rays.

PROTECTION against direct rays of the sun, particularly during the hot summer months, is provided by one company for composition hoses used at natural gasoline truck loading racks.

A length of 7-inch casing, as long as the loading hose, was cut in half length-wise, and hinged together at several points on one side. The lower half of the steel container was bolted to a pipe framework guard rail in such a way that the top half or cover could be closed down to form a convenient, weather-proof receptacle for the hose. A handle of sucker-rod material was welded to the top half for easy operation of the cover. By making it possible to lay the hose in its natural full-length position, its useful life is prolonged considerably without danger of cracks or leaks along the length of the hose or around the fittings at either end.



This fence, constructed in halves, may be pulled apart for workover operations.

2. FENCING

Two Sections Admit Servicing Unit

SURFACE equipment protection in a populated district has been worked out uniformly by operators in the Eureka Heights field on the Texas Gulf Coast. With many wells producing close to dwellings, heavy steel wire fencing has been erected about the Christmas trees and gas lift apparatus in operation there.

The enclosed areas are usually 16 feet square, allowing adequate space for ordinary equipment and for crews to work on the wells. Several fences are constructed in two halves, securely bolted together. By removal of a few bolts, the halves are drawn apart to permit moving in power equipment for workover jobs. Over six feet high, the fences offer an additional protective feature consisting of a section of three or four horizontal strands of barbed wire stretched between one-foot extensions welded to the tops of the steel fence posts and inclined toward the inside of the enclosure at a different angle. Each fence has a steel gate that may be locked.

The steel fences, with wiring stretched taut, are a formidable barrier to trespassers or to stray cattle which frequent the neighborhood. The protection is reciprocal as it affords nearby inhabitants safety for small members of their families.

3. ROD CARE

Rack Protects Rods In Pulling Job

THE best care for sucker rods is none too good, as careless handling may kink the joints to result in wear of both rods and tubing. A light-weight, portable series of racks, that may be moved from well to well as pulling is required, can be made from pipe and rods to maintain the proper care of rods while they are out of the tubing.

One such rack consists of two vertical sections, similar to an inverted letter T; having diagonal braces from the tips of the T sloping to the leg. These sections are joined by a cross member upon which the rods are to be laid down, which are also cross-braced from one section to the other with diagonal rods. The inverted top of the T's are connected by another cross brace to afford a greater surface to bear upon the ground, and to stiffen the unit when stacking on a truck for moving.

THE practical operating hints for the drilling rig and production man, appearing in these features each week, are secured from oil fields everywhere and offer suggestions that will help to improve field efficiency and safety. The items give an excellent picture of the remarkable ingenuity being exercised by the operating divisions of the industry. Contributions to these features will be paid for at the rate of $5 for each illustrated item accepted. Address contributions to "The Editor, THE OIL WEEKLY, Houston."

THE PRODUCTION MAN . . .

This rack protects sucker rods from dirt and injury during rod-pulling operations.

In Illinois, where some of these racks are used, three constitute a set, one to support the middle of the stack of rods, and one at each end of the pile. These racks are easily handled by one man who spaces them while the pulling machine is being erected and guyed down, so that when the first rods are wrenched out of the tubing they can be laid down, a joint at a time, in such manner that they will not become kinked, or become smeared over with dirt and sand from the ground.

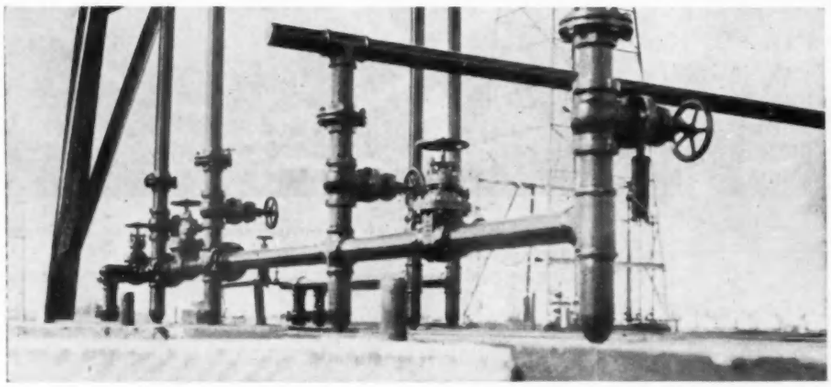
4. GOOD HOUSEKEEPING

Pipe Lines Steadied by Bull-Plug Supports

ONE of the important rules considered for good production practice is to never allow pipe lines—especially those containing high pressure gas or oil—to remain in any extended position without being firmly supported in such a way that no physical strain is present in the line.

One company applies this principle in a practical and neat-appearing manner on each well by using crosses or tees at several convenient places, and then using bull-plugs to form the bottom supports. In a typical installation, the oil and gas lines and valves connecting the well to the over-head trap were conveniently located in a manifold on the derrick floor, and at just the right height to permit use of standard 2-inch bull plugs for supports.

Replacing the usual blocks that are commonly used at such points, the bullplugs make it possible to clean the floor more easily. Bull-plugs placed at such points where the flow stream makes a right-angle turn likewise allow sand particles to accumulate where no harm can be done. At the same time they create cushions at such corners, allowing the force of the stream to be expended against a dead end of fluid or gas, instead of cutting into elbows or pipe walls.



Bull plugs are used to support these pipe lines, eliminating a source of frequent strain at junctions, creating cushions at corners, and presenting a neat appearance.

5. LUBRICATION

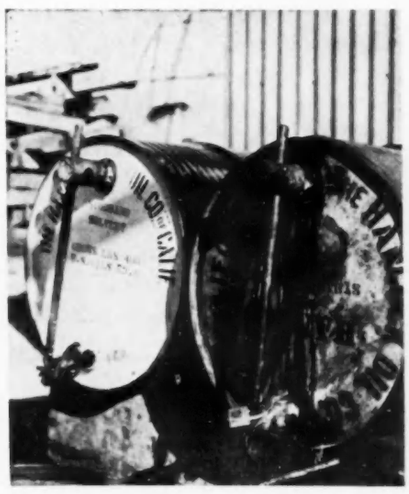
Curb Thefts from Drum Vent Openings

SMALL but continuous losses by theft of small quantities of lubricating oil, solvents and gasoline stored at several of their field pumpers' doghouses, prompted one company to find a means of locking the drums to make them definitely tamper-proof. The small spigot on each drum was kept locked at all times, but access was usually made by means of the vent openings.

The company welder fastened a 4-inch nipple of 2-inch pipe to each of several plugs similar to those that came with each drum. Two ⅞-inch holes, 90-degrees apart, then were drilled completely through the pipe near the outer end. To one end of each of several 2-foot lengths of ¾-inch sucker rod material, several links of medium-sized chain were welded.

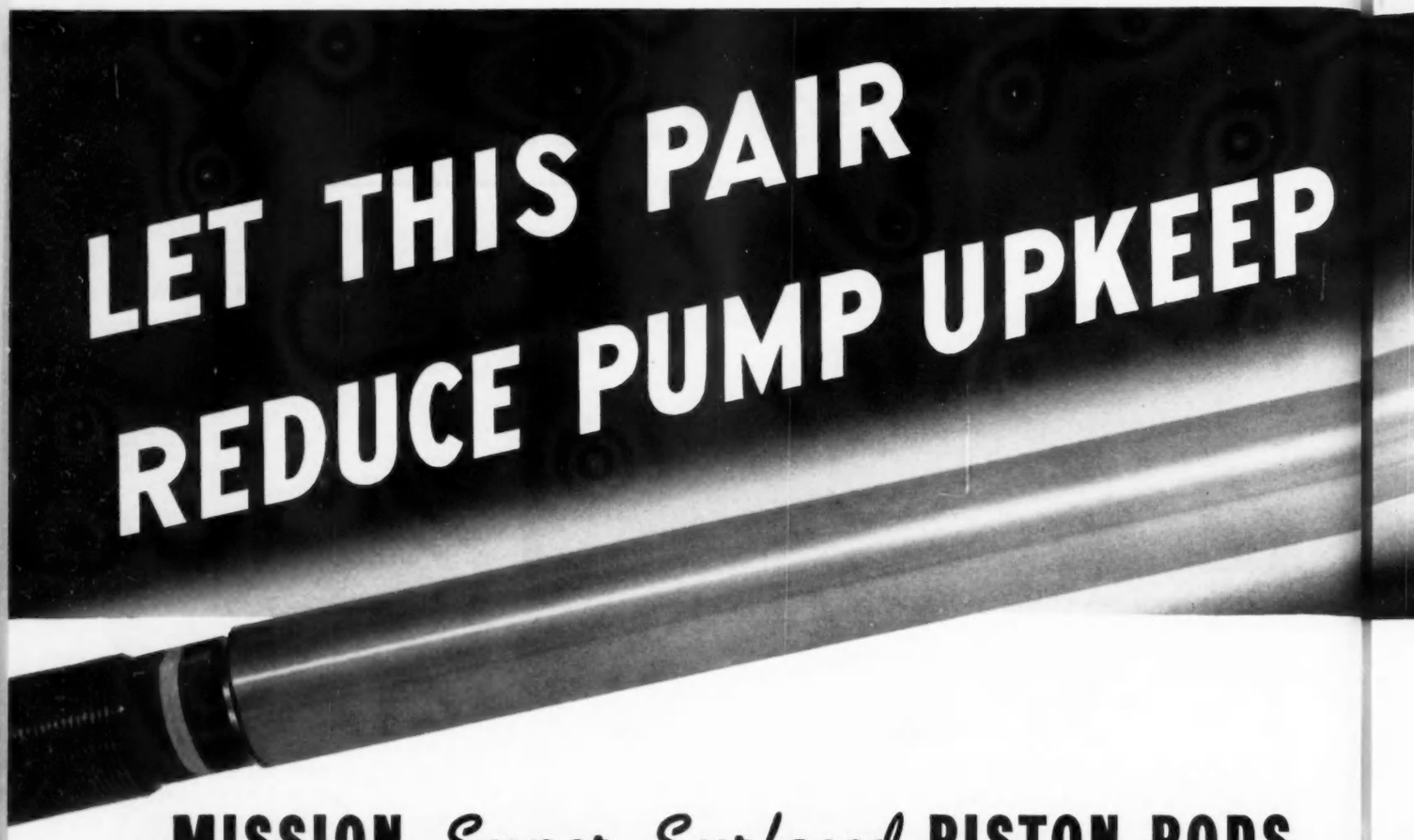
The vent plug of each drum was removed and replaced with the specially prepared one, and the sucker rod bar, after being run through the holes, was then locked to the spigot by means of the chain links.

The installations soon paid for themselves. The arrangement permitted the plugs to remain unscrewed a turn or two for vent purposes, with the drum still locked against theft.



Sucker-rod material and pipe is used to curb oil thefts through vent openings.

LET THIS PAIR REDUCE PUMP UPKEEP



MISSION *Super-Surfaced* PISTON RODS

These rods cost you less in the long run because they last longer . . . they last twice as long as File Hard Rods under ordinary conditions and three to four times longer under corrosive conditions. Yet they cost only about 45% more. This means lower rod costs any way you figure it.

Here's Why They Last Longer:

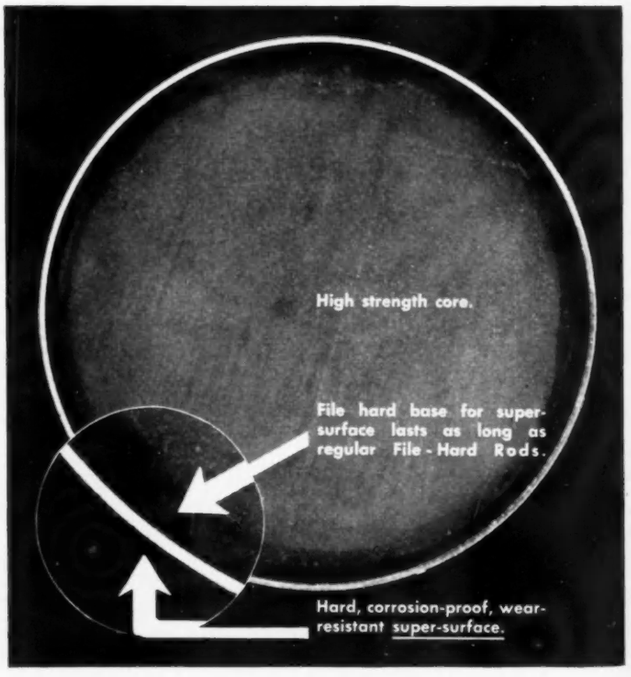
The super-surface is corrosion proof. Ordinary rods pit badly under corrosive conditions. This pitting, and the grooving that results, quickly becomes so bad that the rods must be discarded. Mission Super-Surfaced Rods, however, stay smooth because of the corrosion-proof super-surface coating. This is why these rods wear three to four times longer than File Hard Rods under corrosive conditions.

The super-surface is extremely hard . . . so hard that the rate of wear is much slower than that of a File Hard Rod.

They offer two wearing surfaces. After the super-surface coating is worn off, a regular File Hard Rod remains for another long period of wear.

GUARANTEE

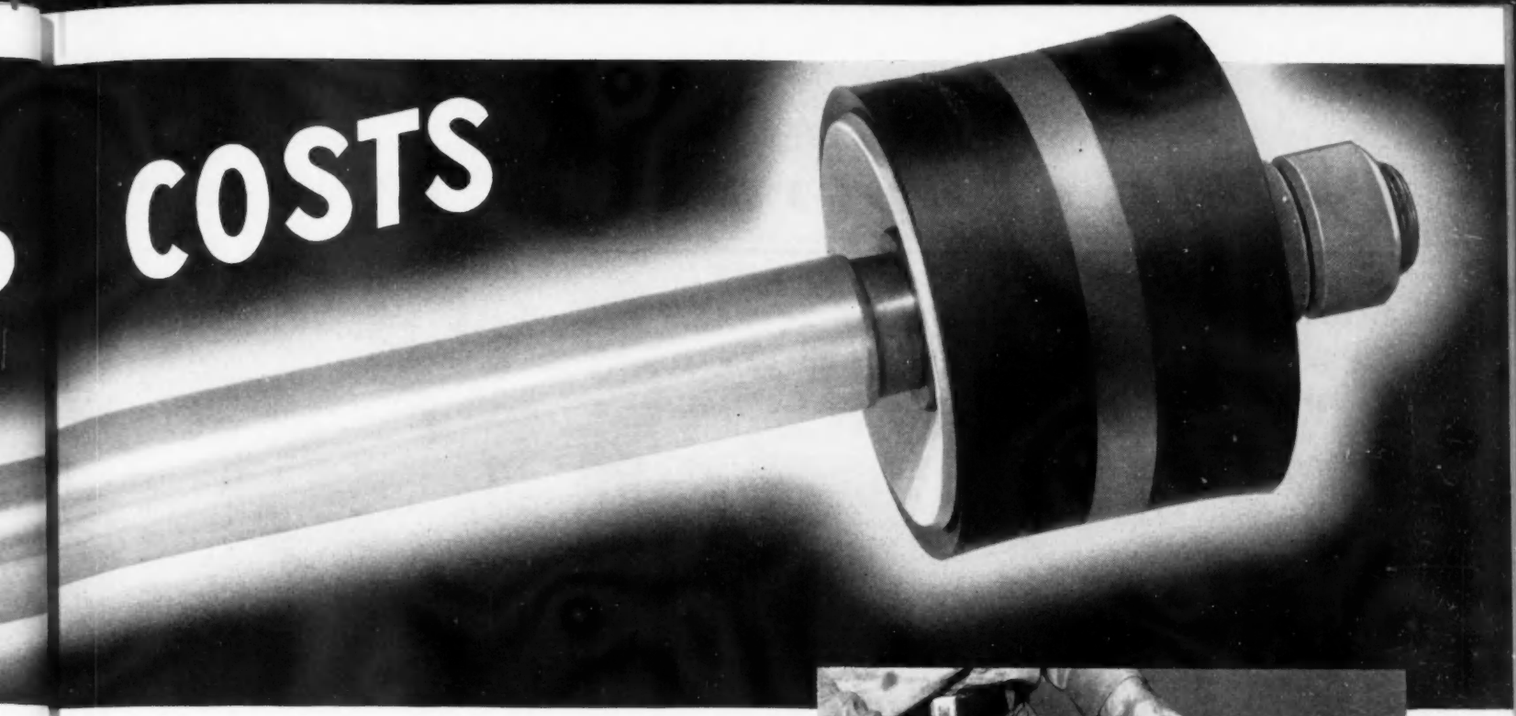
The famous Mission Piston Rod Guarantee protects you from damage to your pumps caused by rod breakage when the Rods are equipped with Mission Pistons of the **proper taper.**


High strength core.
File hard base for super-surface lasts as long as regular File-Hard Rods.
Hard, corrosion-proof, wear-resistant super-surface.

Actual photograph of an etched cross section of a Mission Super-Surfaced Piston Rod.

Thousands of operators have found by actual tests that Mission Super-Surfaced Piston Rods cost far less in the long run. Try them in your pumps. Keep cost records and see how much less they cost you. For minimum rod and packing wear, be sure to use Mission Self-Sealing Gland Packings with these rods.

COSTS



MISSION FLUID END PISTONS

Mission Replaceable Piston Rubbers mean low replacement costs. You don't have to pay for a complete new piston every time rubbers wear out. Simply install new rubbers on the old piston body and you are ready for another long run.

You get a double saving with Mission Pistons. In addition to saving the cost of a new piston body when rubbers are changed, you save because these tough rubbers stay in your pump longer without trouble.

GUARANTEE

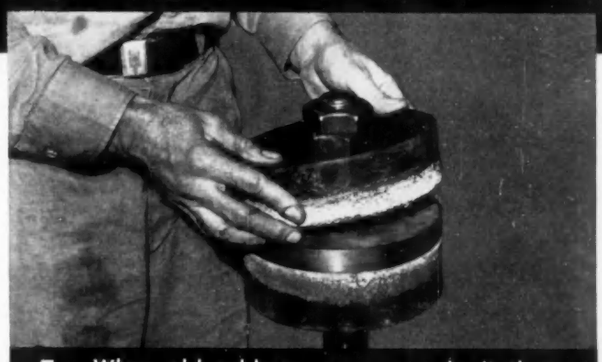
Test Mission Pistons in your pumps. If they do not prove to be more economical than the pistons you are now using the full purchase price will be promptly refunded.

Complete information, including prices on Mission Pistons are found in your 1941 Composite Catalog. These pistons, along with other Mission Products are at your favorite Supply Store. **Mission Manufacturing Company, Houston, Texas. Export Office: 30 Rockefeller Plaza, New York.**

MISSION

SLUSH PUMP PARTS

Your pumps stay running longer and cost less to repair when equipped with Mission Pump Parts



1. When old rubbers are worn, don't throw away the piston, remove the old rubbers and save the piston.

2. It's not even necessary to remove the piston body from the rod. You save on shut down time when rubbers are changed.

3. New rubbers are installed and the piston is ready for another long run at about half the cost of a new piston.

Practical Operating Hints for

1. DERRICK RIGGING

Casing Section and Large Concrete Block Provides Sturdy Permanent Deadman

This sturdy deadman consists of a section of casing set in a large block of concrete.

THE ever-present possibility of damage to derricks due to high-velocity winds during certain times of the year has prompted one operator in the Burnett pool of Western Kansas to take extra precautions in setting guy-line anchors.

Finding the conventional deadman consisting of a buried log or other heavy object was not solid enough to prevent a derrick from being blown over, a 5-foot length of 7-inch used casing is set in a hole filled with concrete. A 1-inch eye-bolt is run through a hole cut through the casing as close as possible to the ground level. Approximately 12 inches of threads on the eye-bolt afford ample adjustment and take-up as the guy-line stretches while in use. The hole in the ground is belled out slightly at the bottom in order to provide for still better anchorage.

Another advantage, offsetting the slightly higher initial cost of this method, is that the production department, in operating the well for years to come, will know that firm, dependable anchors are present. If the rig contractor or drilling department has installed another type, it is never positively known what size dead-man was used or to what depth it was buried.

The long kelly is more easily laid down on the walk with this convenient dolly.

2. MATERIALS HANDLING

Casing Used to Make Dolly for Kelly

THE problem of safely handling a 52-foot kelly each time it is laid down on the walk, was solved in an easy manner by the superintendent of one company by constructing a small dolly to aid in laying down the long joint.

A 24-inch length of 10¾-inch casing was cut open, leaving two ears on each side in which were cut 2-inch holes. A bottom was welded in the one end, and directly beneath that end an axle and pair of small wheels were assembled. The dolly is placed just below the A-frame, and stood on end as the end of the kelly is placed in the cradle. A short crowbar then is run through the two holes over the body of the kelly.

In this manner, the end of the kelly is easily guided out along the walk as the joint is slowly lowered by the traveling block. When the kelly is picked up from the rack, the procedure in handling the outer end is reversed.

3. DRILLING PRACTICE

Two Ratholes speed Drill-Pipe Makeup

DRILLING time is cut by one company by eliminating the usual procedure of breaking off the kelly joint and lowering it into the rathole each time a new joint of pipe is added to the drilling string.

A second rathole, smaller and not quite so deep, is put down close to the rotary table on the side opposite the drawworks. The next joint of pipe to be added to the string is placed in this rathole with the sandline or catline while drilling is going on. By adding an extra length of hose to the normal rotary hose—the length depending upon the

A second rathole adjacent to the rotary table aids to speed drilling operations.

length of the kelly and the height the mud stand-pipe is above the rotary table—it is possible to add the extra joint each time without removing the kelly and swivel from the traveling-block hook.

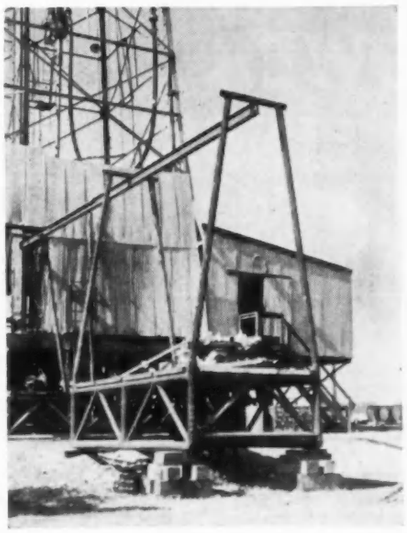
When a new joint of drill pipe is needed, the string is pulled up until the slips can be set to hold the joint just below the kelly connection. The kelly then is broken off, and swung over and screwed into the joint standing in the new vertical rathole. If the joint cannot be bucked up tight enough with the tongs, it can be completed after it is set in the slips in the table. Making use of the extra length of the rotary hose, the block and swivel carrying the kelly and the extra joint are run up high enough in the derrick to allow the new joint to be screwed and bucked up completely in the drilling string, after which drilling can be concontinued.

A neat hinged steel disc covers the opening in the floor when the auxiliary rathole is not in use.

4. MATERIALS HANDLING

Chain Hoist Aids to Move Heavy Pieces

FOR handling heavy bits and other drilling tools, one company has built a combination chain hoist track support and storage wharf to be used in conjunction with unitized heavy drilling tools.



This chain hoist and support aids in handling heavy bits and other tools.

The wharf end of the unit has a wood floor and two track supports, open on all four sides, but set at a height so that supplies can easily be moved from truck bed to the platform. The rig end of the unit has a small platform to receive bits and small tools directly from the truck when driven next to the derrick. The trolley runs the full length of the unit, and is a means of speeding up operations as bits and other equipment can be moved from the rotary table to the truck with a minimum of effort.

Halved drill-pipe protectors are employed to curb wear from throbbing.

5. RIGGING UP

Protectors Curb Strain On Mud-Line Fittings

AN appreciable saving is effected by one company by employing rubber drill-pipe protectors on various surface fittings and lines.

At points where throbbing and mud-pump vibrations tend to cause excessive wear to the rotary hose, or other flexible hose couplings and lines around the drilling equipment, split protectors are slipped over the points of contact. Derrick girts, railings and sharp floor edges are among common points of wear at which the easily installed protectors are used.

6. ROPE CARE

Undue Strain Curbed By Rounded Corners

CATHEAD lines, high-line ropes and other soft-rope lines represent a comparatively small part of the equipment cost on each well, but premature line breakage and serious accidents may be avoided to a great extent by seeing that sharp corners around the derrick legs and equipment do not injure the lines.

Short lengths of split 8- and 10-inch casing placed around the base of the derrick legs prevent scuffing of lines when heavy objects are being pulled in from the more remote sections of the derrick and location.

Just in front of the cathead, another type of combination guard and guide may be used to good advantage. Two lengths of pipe anchored to the floor, and at a point several inches away from the side of the drawworks, serve as a safety guide for making up tong line. A small pulley on the front and top side of this guide provides a point about which the high-line rope can turn with very little wear on the line.

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HIGHLIGHTS IN THE WEEK'S NEWS

Courts

Nolo Contendere Pleas End Madison Anti-Trust Suit

In the final action in the Madison oil industry anti-trust suits, two companies and five individuals entered pleas of nolo contendere before Federal Judge Walter C. Lindley at Madison, Wisconsin, last week, accepting fines totaling $20,000 rather than stand long trials. Charges against two individuals were dismissed.

The suits were filed in the federal court for the western district of Wisconsin five years ago on indictments alleging conspiracy to artificially raise gasoline prices in mid-western states through buying programs, and to control jobber margins through uniform contracts. First trial on the charges extended four months in 1937-38, and resulted in dismissal of some defendants, retrials for others, and conviction of still others.

Defendants entering pleas last week were among those granted retrials, while charges against Harry D. Frueaff, vice president, Cities Service Export Oil Company, Tulsa, and H. E. Brandle, general manager of the company, New York, were dismissed.

Fines of $5,000 each were levied against Standard Oil Company (Indiana) and Cities Service Oil Company. Individuals fined were Edward J. Bullock, vice president, Standard (Indiana), $2,500; Alexander Fraser, president, Shell Oil Company, $2,500; A. G. Maguire, board chairman, Wadhams Oil Company, $1,500; O. J. Tuttle, sales manager, Empire Oil & Refining Company, $2,000, and H. J. Kennedy, vice president, Continental Oil Company, $1,500.

Legislation

Michigan Passes Bill to Facilitate Leasing Activity

A bill to give circuit courts authority to validate oil and gas leases without signatures of minority fee owners was approved by the Michigan legislature just before adjournment. The bill had the support of the Oil and Gas Association of Michigan, and several powerful farm groups.

It was sponsored by the oil association as a measure to eliminate the growing problem of clearing title to leases where earlier royalty plays had split and scattered minority interest owners to the four winds. The act provides that majority owners of royalty fee may bring action in a circuit court to validate title. Under terms of the bill, the minority interest or interests may elect not to grant drilling privileges and become a partner with the development company. Such a procedure would require the minority interest owner to provide bond adequate for his proportionate share of drilling.

Governor Van Wagoner previously had expressed his approval of the legislation.

A bill to clarify powers over natural gas by the Public Service Commission died in committee.

During the session the legislature passed a resolution renewing Michigan's membership in the Interstate Compact Commission for two more years.

Texas Legislators Delay Passage of Proration Extension

The Texas legislature last week moved toward final disposition of bills affecting the Texas oil industry. The senate passed finally the bill, which extends the general proration laws. However, the house had passed the bill as a permanent measure, and the senate amended it to extend two years from present expiration in September. When the bill was sent back to the house that body rebelled against the two-year limitation, and sent the bill to a free conference committee.

The house oil, gas and mining committee had reported a bill by Clayton Bray which redefines the marginal well statute. It would forbid the railroad commission allocating to any well less oil than the minima provided in the marginal-well statute.

The house killed a senate bill which would give the railroad commission the power to permit use of sweet gas for carbon black.

Meanwhile, both houses were debating the question of adjournment.

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Washington

California Price Inquiry Opens in San Francisco

Scheduled investigation of recent price increases on crude oil and gasoline on the West Coast, slated to open in San Francisco June 7, is not expected in industry quarters to result in protests being lodged by officials of the office of Price Administration and Civilian Supply. Spokesmen for several industry groups have expressed opinion that any fair appraisal of the price base on the Pacific Coast can only result in approval of increases inaugurated on both gasoline and crude oil during April and May this year.

Following announcement of the investigation, Standard Oil Company of California, usually the leader in establishing price schedules in the area, issued the following statement:

"When the government authorities meet with the California oil industry, they will find that the increases in price offered to producers of crude oil, and the selling price of gasoline, are justified. The price of the company's regular grade of gasoline is now ½-cent lower than the price in effect before the reduction of last May 27, 1940."

The hearing was to be before Dr. J. K. Galbraith, director of the price division, and Quinn Shaughnessy of the fuel section, Office of Price Administration and Civilian Supply. On April 24, crude prices in California were increased 5 to 10 cents a barrel, and on May 23 a further advance ranging to 12 cents a barrel and averaging about 6 cents, was made in all California fields. Corresponding increases in gasoline totaling 1-cent a gallon paralleled the advance in crude.

The view is generally held in West Coast oil circles that the San Francisco conference will result in an agreement between OPACS officials and 30 companies invited to attend that before any further price changes are made, that that office will be consulted. It was intimated, however, in the announcement of the meeting, that price levels in California were out of line with crude prices in the mid-continent.

Wilson Blames Railroads For "Irreparable" Delay

The obstructive position adopted by the railroads toward the crossing of their tracks by petroleum pipe lines has resulted in "irreparable" delay in developing new transportation facilities to offset the withdrawal of tankers from the Atlantic service, the Society of Automotive Engineers, holding their spring meeting at White Sulphur Springs, W. Va., were told June 4 by Dr. Robert E. Wilson, petroleum consultant of the Office of Production Management.

"Both the OPM and the industry has been aware since last summer, long be-

fore diversion to British service was contemplated, that there was a tight situation in tankers, and by early last fall orders had been placed for 75 new tankers," Wilson explained. "However, because of the overloading of shipyards with Navy and other business, it has been possible to schedule only 28 for completion during 1941, which was barely enough to meet the prospective growth in demand plus Navy needs. Several weeks ago the Maritime Commission authorized the building of new yards to be devoted solely to the building of tankers, and ordered construction of 72 new tankers in these yards. The first of these will be available about the first of next year.

"The industry and the OPM also have been urging strongly since August, 1940, that rights of way be granted for two large pipe-line projects into the Southeastern States which the industry was ready to build, but these were blocked by railroad opposition and the surprising refusal of the Georgia legislature to enact the needed legislation in spite of urging by the President, the Secretaries of War, Navy and Interior, and by the OPM. It is hoped that this situation will be cleared up very soon by the passage by Congress of the pending Cole bill, which will give federal rights-of-way to interstate carriers certified by the President as being in the interests of national defense. This also will make possible the construction of at least two other major pipe line projects which the industry is ready to build, bringing the total expenditure for new pipe-line projects to relieve the tanker situation, and to be financed by the industry, to well over $100,000,000. However, the delay already suffered is irreparable, and the larger of the projects now needed to cover the tanker shortage will require about 12 months to complete.

"The industry also has indicated its willingness to proceed at once with a cooperative project to build 12 new shipways and construct about 50 large high-speed tankers, again at a cost of over $100,000,000. Again, however, nearly 12 months would be required before deliveries could begin, assuming reasonable priorities."

Wilson told the engineers of the activities of the fact-finding committee of the API, whose report had been laid before the OPM and Secretary Ickes the preceding day, and outlined the steps that have been taken to fill the deficiencies in East Coast transportation.

"However," he said, "it is apparent that to fill the gap caused by the diversion of the second lot of 25 tankers will take at least nine months, assuming no more diversions. There also is a shortage of foreign flag tankers to supply the East Coast's customary imports of heavy crudes and fuel oil from Venezuela and other Caribbean points. As a result, it appears that some form of moderate curtailment of East Coast consumption will be necessary this summer and fall."

There is no prospective shortage in any petroleum product needed by the armed services, whose demands are small when measured against the capacity of the industry, he said.

Washington Oil Round Up

[*Continued from page 12*]

tion which officials said contained "highly confidential" material and in which specific recommendations were proffered for meeting the oil shortage which is expected will make itself felt in the near future.

Envisioning gasolineless Sundays, restriction of residual fuel oil consumption, reduction of house temperatures in order to save distillate fuel oil, and restrictions on the use of kerosene for heating purposes on the East Coast, the report recommended that a formal, industry committee be set up to work out, with the federal agencies, all problems relating to the defense use of petroleum and its products.

Following the conference with Secretary Ickes, W. R. Boyd, Jr., executive vice president of the API, told reporters that the oil administrator was favorably impressed with the committee's work, and that the group will continue to function in order to fill in various parts of the surveys which have been initiated, particularly regarding a proposed pipe-line program, and there were indications that the group will further investigate the possibilities of barge transportation, sending a questionnaire on that subject to companies throughout the industry over the signature of Secretary Ickes.

A number of projects were outlined for consideration by the formal industry committee which was recommended, among them: The exchange of products to avoid needless transportation operations; assistance to government agencies in relation to purchases and deliveries; conservation of supplies and materials used by the petroleum industry; priorities; protection of industry facilities; shipbuilding and construction of other water transportation facilites; and all transportation problems, including pipe line, tanker, barge, tank car and tank trucks.

"The committee cites the above as illustrative of some of the problems that immediately come to mind," it was explained, "but as the dislocation of transportation facilities will carry its effects back to the entire oil producing, refining and distribution branches of the industry, obviously, there will be very many other problems not specifically mentioned which will have to be met and dealt with cooperatively."

Tonnage Lost

In a summary of the report submitted to the OPM and Secretary Ickes, details of which were held strictly confidential, the API committee pointed out that as a result of the diversion of 50 tankers to British service, there is a tanker tonnage shortage against total United Sttaes requirements, including imports, of 494,000 deadweight tons average over the third and fourth quarters of this year and the first quarter of next year, reaching a peak in the last quarter of this year of 636,000 deadweight tons.

"This assumes no further requisitioning of American flag tonnage and in addition that the amount of foreign flag tonnage used for imports during the first quarter of this year will continue to be available," it was stipulated. "To the extent that further requisitioning of American flag ships takes place or foreign flag boats now used for imports become unavailable, the above shortages will be correspondingly increased. Against further withdrawal should be considered the possibility of the application either directly or indirectly of seized and interned tankers in Western Hemisphere ports against trans-Atlantic service."

However, the report continued, it is possible that there may be some alleviation of this shortage by increased barge and pipe-line movements, the easing of load limitations on tankers, substitution of Gulf Coast Supplies for the intercoastal movement, and rearrangement of South and Central American supplies which might reduce the shortage to 230,000 deadweight tons.

East Coast Needs

During the current year it is expected that, without any restriction, consumption on the East Coast would include 224,000,000 barrels of motor fuel, 161,000,000 barrels of residual fuel oil, 89,000,000 barrels of distillate fuel, 41,000,000 barrels of kerosene and 12,000,000 barrels of lubricating oil, a total of 527,000,000 barrels.

"To arrive at the probable savings in consumption through restrictions, it is necessary to consider each product separately," it was pointed out. "The only effective way to conserve motor fuel would be to restrict pleasure use through some such device as 'gasolineless' Sundays. It if be assumed that the consumption of gasoline might be reduced by as much as 15 percent without undue hardship and if these were applied to the East Coast, the reduced consumption would amount to 34,000,000 barrels.

"Restriction of residual fuel oil consumption could be brought about by converting to coal plants which are in a position to use either coal or oil. It is not possible to determine how much residual fuel oil could be saved immediately by conversion, but it is estimated that perhaps as much as 15 percent of the total demand could be eliminated over a period of several months.

"Distillate fuel oil is used largely for heating purposes. Therefore, any effective restriction would have to be obtained in this type of usage. If house temperatures were reduced by an average of about 5° F., approximately 10 percent of the consumption of heating oils could probably be saved. This per-

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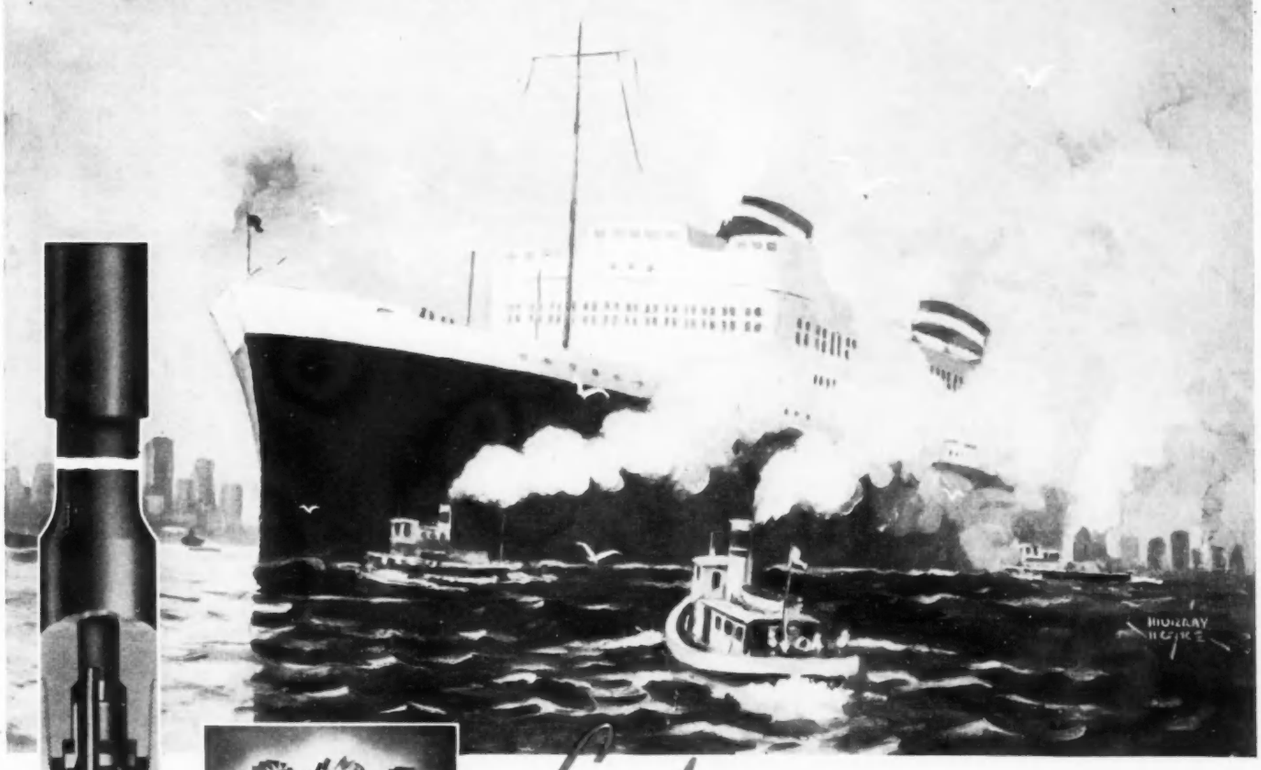

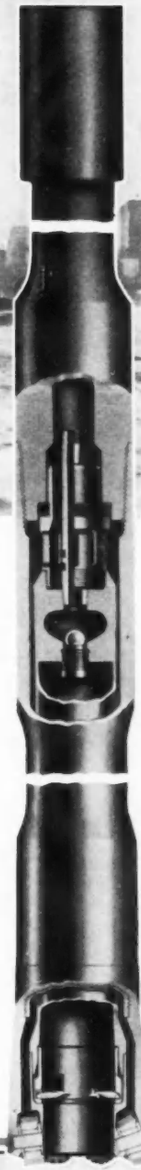

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centage of heating oils represents approximately 8 percent of the total demand for distillate fuel. It is also possible that the distillate fuel used by gas companies for gas enrichment could be eliminated by sacrificing Btu content. If this were done, perhaps an additional 3,000,000 barrels could be saved.

"Kerosene is also used chiefly for heating purposes. It is estimated that perhaps 10 percent of the consumption of this product could be saved through restriction of its use."

On the basis of these estimates, it was declared, approximately 71,000,000 barrels could be cut from the total requirements of the area, equal to 13.5 percent of the total East Coast demand and equivalent to the current carrying capacity of approximately 50 tankers of 10,000 deadweight tons.

Involved in the committee's suggestion for the use of foreign tonnage available here, if further American tankers are turned over to the British, it was pointed out that use of Italian, Danish and German tankers in United States ports would contribute approximately 50,000 deadweight tons, and in addition there are approximately 25,000 tons of idle French tankers in our ports.

Furthermore, Italian, Danish and German tankers in Venezuela account for an aditional 50,000 tons, and those in Mexico for 80,000 tons. In addition, the report pointed out, "it should be noted that there are about 100,000 tons of French flag tankers at Martinique."

Balancing all the factors in the situation, the committee came to the conclustion that "barring the withdrawal of additional large amounts of tanker tonnage from the United States and Western Hemisphere service, the situation after the first of next year should be considerably easier, and that the critical period will be during the coming winter.

"If further requisitions or withdrawals of Western Hemisphere tonnage do take place, the only offsetting factors for relief during this period are listed in the report, chief of which are additional tanker construction over that now scheduled and the large products pipe lined from the Gulf to the Atlantic Seaboard."

Other steps suggested by the API for a coordinated pipe-line program included immediate use of existing capacities east of Lima, Ohio; use of existing facilities east of Chicago which might be supplemented by new construction; building of new lines from Portland, Maine, to Montreal, and from Baton Rouge into Georgia, South Carolina and North Carolina.

Ship Seizure May Help

Possibilities that the oil shortage may be somewhat alleviated were voiced June 6 when President Roosevelt signed a bill authorizing seizure of some 80 foreign ships in American waters.

Ickes, immediately upon signing of the bill, asked the Maritime Commission to determine how many of the foreign bottoms which are to be taken over could be used to move oil. It is said that eight German, Italian, Danish and French tankers were among the vessels to be seized, and there was some expectation that they would be put into the Gulf-Atlantic service.

Ickes to Make "Adjustments" National

In his first formal statement as oil administrator, Secretary Ickes on June 4 declared that "all of us" would have to make "some kind of adjustments" to meet the prospective oil shortage, indicating that any orders laid down would apply to the nation generally, rather than only to the East Coast.

"We face a set of hard facts," he said. "I am sure that American industry, as well as individual citizens, can help to meet the situation. Conservation of petroleum products is certainly one way."

Estimates by Interior Department officials that Japan now is importing from 60,000 to 70,000 barrels of oil daily from the United States, sending ships to the West Coast for it, were disclosed by the department, but it was pointed out that Japanese imports from this country bear little or no relation to the threatened shortage in the East.

The lack of adequate supplies will become apparent next month, it was warned, and will become progressively more acute as the year wanes.

Ickes made public statements of representatives of the Oil Burner Institute, pledging assistance in the emergency by bringing about more efficient use of heating equipment in homes, buildings and factories.

Secretary Ickes, on June 5, indicated that he would not hold restrictions up until the shortage became serious, but would impose them almost immediately so as to have a margin of stocks for emergency.

He told newspapermen that restrictions will be promulgated within a month or so—"as soon as I can get my feet on the ground, I will do what is necessary," he said.

However, he explained, he will have to study the available data on stocks of the various oil products before making any decision as to what commodities shall be rationed.

The oil administrator gave the impression that the shortage will be more acute than originally figured, saying that it might become so critical as to necessitate an entire suspension of pleasure driving rather than merely "gasless" Sundays.

Already, he had discussed the problem with President Roosevelt and was working on a program to reallocate tanker and other shipping facilities but without hope that it would be adequate to meet the deficiency in supplies.

Rejecting all proposed amendments which might tend to repel the private capital which it is hoped will be employed in the constrution of new pipe lines, the House of Representatives on June 5 passed the Cole bill giving condemnation rights to new lines, government or private, certified by the President as necessary to the national defense.

In only one important respect was the bill amended, the House agreeing to a proposal by Congressman Charles A. Halleck (Rep., Ind.) that any pipe line operated by the government must be turned over to private operation within a year after the end of the emergency.

The bill was brought up in the House by unanimous consent, short-circuiting the Rules Committee, which on June 3 was asked to give the measure right-of-way on the floor but had not acted on the request. It was taken up under an agreement to limit general debate to one hour, but not even that much time was required for discussion, there being no real opposition to the measure.

Under the terms of the legislation, the President may issue a proclamation when he finds that any pipe line in interstate commerce is or may be necessary for national defense. Private companies constructing such lines are to be given the power of eminent domain. In the event private capital cannot be found for the construction of a desired line, the President may order it built by the government.

To insure the completion of lines undertaken by private capital, the bill provides that loans may be made by the government for their completion.

All lines built under the provisions of the bill are to be operated under such terms and conditions as the President may prescribe as necessary for national defense purposes. Under the Halleck amendment, such control would cease and government operation of government-built facilities would end one year after the emergency.

While privately built lines are to be subject to the Interstate Commerce and Natural Gas Act, it is provided that the President may relieve them from conformity with those laws or any act amendatory thereof or supplemental thereto, including the Elkins Act.

In passing the bill, the House rejected proposed amendments which would have prohibited owners of new pipe lines from using them to transport their own products.

Cole Pushing Pipe-Line Bill

Disclosing that he had "heard rumors" that more tankers were to be diverted to the carrying of oil for Britain, Representative William P. Cole, Jr., (Dem., Md.) urged the House Rules Committee June 2 to grant a rule providing for immediate consideration of the government pipe-line bill, and revealed plans for extension of the proposed Baton Rouge-Greensboro pipe line to Philadelphia and an increase in size from 11 to 22 inches, expanding its capacity from 80,000 to 225,000 barrels a day.

Appearing on behalf of the Interstate and Foreign Commerce Committee, which had unanimously approved the measure, Congressman Cole explained that the need for the line from the Gulf producing areas to the Atlantic Coast consuming centers had become imperative as a result of the transfer of 50 tankers from that service.

Were the Georgia situation alone involved, he said, the committee would not have pressed the bill for action.

Cole laid before the Rules Committee a letter from Acting Secretary of the Navy James Forestal, in which he said "the Navy Department is vitally interested in the development of the pipe line facilities contemplated in this bill to insure the expeditions, safe and economical transportation of petroleum products."

He also called the committee's attention to similar endorsements by Secretary of War Stimson and Secretary of the Interior Ickes, admitting, however, that the latter's letter had been written prior to his appointment as oil administrator.

Asked by committee members as to the availability of steel for construction of pipe lines, Cole explained he had received assurances from William S. Knudsen and Sidney Hillman, co-directors of the Office of Production Management, that additional transportation facilities would be recognized as essential and that the necessary priorities

would be granted for the procurement of pipe.

Private Capital for Lines

Assurances have been given by the oil industry that private capital will be available for the construction of all needed lines, he said, and it is not expected that the government will have to spend a cent on such projects. The cost of the proposed Gulf-Philadelphia line, which actually may go on to New York, was placed at $60,000,000 to $70,000,000.

In contemplation of the construction of the lines by private capital, he pointed out, the committee had rearranged the bill so as to give precedence to such construction and make government construction available only in the event private builders could not be found.

Members of the rules committee expressed opposition to any legislation which would permit the government to operate lines built by it, after the end of the emergency, and suggested an amendment providing that if the government built any lines they would have to be turned over to private operators upon the return of normal conditions.

There was also some question as to whether Secretary Ickes, as oil administrator, did not have the power to provide for the construction of new transportation facilities, and there were suggestions that legislation introduced by Senator Robert R. Reynolds (Dem., N. C.) at the request of the War Department, authorizing the government to take over any private property, involved similar authority.

Construction of a second line from the Gulf to the East also was under contemplation, it developed. Of the two lines, one would be used to move crude oil and the other gasoline. Some confusion exists as to the capacities of the lines, one source placing them at 24 and 20 inches, respectively. Either line could be built in five or six months, it was said.

Investigate Supplies to Axis

Evidence on the movement of United States oil and other war materials to the Axis powers and Russia, and views on the desirability of a Congressional investigation of the situation, were obtained from General R. L. Maxwell, administrator of export control, and officials of the State Department and other agencies June 4 by the House Rules Committee, urged to grant right-of-way for an investigatory resolution sponsored by Representative John M. Coffee (Dem., Wash.).

Decision to call defense officials for questioning was reached by the committee after Congressman Coffee told it that 900,000 barrels of high-test gasoline had been shipped to Japan alone during March, 1941, and that shipments of materials of war, such as machine tools, oil and manufacturing equipment, to Russia "have increased 500 percent recently." Some of these supplies, he declared, were being forwarded to Germany and Italy.

The Congressman declared that the war materials were going to the Axis powers through "third parties" and "dummies." "American and even British companies are selling supplies to the Axis against the spirit of our defense effort, if not against the letter of the law," he said.

Coffee called attention to recent reports of renewal of a contract under which American and British oil companies were delivering millions of barrels of oil to Japan from the Netherlands East Indies, and asserted there also have been reports of oil exports from California to Japan and of oil deliveries by United States and British companies from South America and the West Indies to neutral African ports.

"Trade in war materials is the least of our dealings with Axis powers," he commented.

"American companies are participants with these powers in international patent pools, insurance pools, shipping pools, cartel agreements, gold purchases and financial arrangements whereby money, credit and intelligence are exchanged solely to the advantage of 'double-dealing patriots' in America and their Axis partners.

"An investigation of present conditions now may lead to measures which could shorten the war several years. Indeed, it might result in changing its entire outcome. On the other hand, an apathetic attitude toward the double-dealing situations which now exist may lead to disaster."

Becaused of the delicacy of the matters involved, General Maxwell and other officials were questioned behind closed doors.

Japan Shipments Hit

Meanwhile, at the capitol, the threat of gasoline rationing came in for attention, with Representative Raymond Springer declaring gasless Sundays in the United States were so incompatible with continued shipments of oil to Japan that "it should not be countenanced by the people of this country."

Representatives of both the oil industry and oil-producing states are expected to be acquainted with plans of the coordinator at meeting scheduled next week.

Ickes Asks Illinois Cooperation

Ickes wired Governor Green of Illinois, asking cooperation in bringing about conservation in that state.

"For several years I have been advocating the necessity of petroleum conservation by the oil-producing states," Ickes told Green. "While oil conservation is essential at all times, in the emergency which now faces the country, it is imperative. I urge you to give this problem your immediate personal attention to the end that Illinois enact a law to eliminate as far as practicable the waste of oil and gas and at the same time eliminate the drilling of unnecessary wells."

Commenting on the telegram, Green said:

"Everything possible has been done and will be done to cooperate in any efforts which will further national defense."

The governor recalled it was at his suggestion that the Illinois legislature considered a conservation measure during the current session, and that the measure is still pending.

Aviation Gasoline Expansion

A 25 percent expansion of the capacity for the production of finished 100-octane avaiation gasoline has been recommended by Dr. Robert E. Wilson, petroleum consultant of the Office of Production Management, and the Joint Aeronautical Board of the Army and Navy, it was announced June 4 by the OPM.

The recommendation, which, if followed, would raise the capacity for the production of military and naval aviation fuel to a total of about 50,000 barrels a day within the next 18 months, was made in view of the recent increase in prospective requirements of both the United States and British air forces, it was explained.

"These requiremetns are such that it was deemed necessary to request a 25 percent increase in addition to plants now built and building despite the fact that industry capacity is still substantially greater than present demands and entirely adequate for the next twelve months," the OPM stated.

"While the Army and Navy are not now in a position to place firm orders for the output of the expanded capacity, they have agreed to recommend that any new 100-octane plants, at least up to the total capacity specified, be given the benefit of accelerated amortization for tax purposes."

No expansion in facilities for the production of 91-octane or lower octane gasoline is deemend necessary at this time, it was said.

Texas Commissioners Cautious In Comment on Coordinator

Announcement that Washington was taking over the oil industry last week appeared to be a surprise to members of the Texas Railroad Commission who were in Austin. Both Commissioner Jerry Sadler and Olin Culberson issued statements carefully.

Sadler declared that he was, and had been, consistently for the President and thought that the passage of the new market-demand statute for Texas, and the passage of the permanent proration law, would serve to strengthen the position of the Texas oil industry in Washington.

Culbertson, in his statement, insisted that the oil industry was prepared and equal to the emergency, but he regretted very much "that the discriminatory withdrawal of tankers from the Gulf Coast has brought about a situation upon which this far-reaching decision had probably been made."

Both commissioners thought that there would be little immediate effect on Texas operators. They pointed out that most of the trouble appeared to be on the East Coast, and constituted transportation problems primarily.

Subsequently, however, Sadler pointed out that Texas had a man who could well be appointed Deputy Coordinator to put into effect the plans which Secretary Ickes and the President contemplated. Alvin J. Wirtz, who resigned as Under Secretary of the Interior on May 26, was Sadler's choice.

The commissioners pointed out that Wirtz was well thought of by the President and by Secretary Ickes, and that he was thoroughly acquainted with the oil industry. Several oil men in Austin, during the course of the week, endorsed Wirtz for the new post.

Meanwhile, no further communications were received from Washington, indicating the attitude of the federal authorities toward Texas or the other oil producing states. Just how far Washington might go was the question everyone wanted answered. Sadler pointed out that there was a wide distinction

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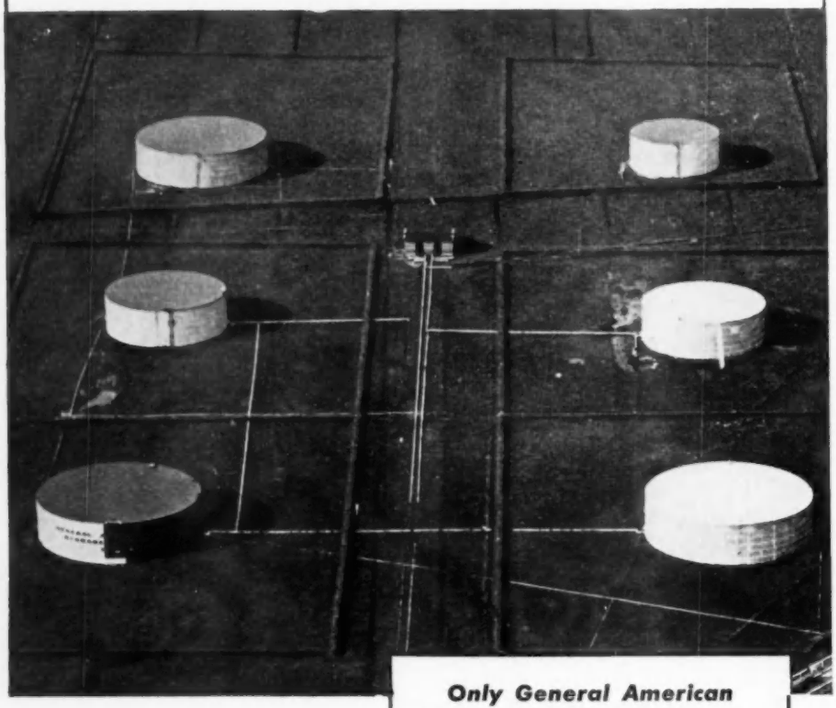

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3. **RELIABLE CUSTODIANSHIP.** Our warehouse receipts are highest type of collateral everywhere.
4. **INDEPENDENT OWNERSHIP.** Strictest privacy; we do not buy, sell or refine any commodities.
5. **NO WHARFAGE.** There is no wharfage charge at our own private docks.
6. **SPEED WITH SAFETY.** Day and night crews, complete facilities, eliminate all shipping delays.
7. **WORLD'S LARGEST TANK CAR FLEET.** One car or hundreds, wherever and whenever needed.

Strategically located to serve you!

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GENERAL AMERICAN TANK STORAGE TERMINALS

Goodhope, La. and Westwego, La., (Port of New Orleans)
Corpus Christi, Texas
Carteret, N. J. (Port of New York) **Galena Park, Texas** (Port of Houston)

A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

between an executive order and the letter which the President wrote to Ickes. Under the provisions of an executive order, the entire industry would have been placed on a war footing, subject to orders from Washington.

Sadler thought that if the industry and the regulatory bodies cooperated with Washington, most of the state organizations would be undisturbed.

Texas Statewide Hearing Set for June 16

The Texas Railroad Commission has scheduled its monthly statewide proration hearing for June 16. It is expected that at this time, the commission will have further information on the situation in Washington, and may be able to tell operators what they may expect.

By that time, it is probable the market-demand statute will be enacted and in effect, and operators may find it necessary to present evidence on a different basis, in order to get the allowables which they desire. In the event proposal becomes law, physical waste would be a less important factor and the commission would be less interested in market demand from particular fields.

Under the bill which is pending in the Texas senate now, the railroad commission could determine the total demand for various grades of Texas crudes and then allocate it among fields producing those grades. Presumably, the formula in effect since March 10 would remain in effect, but this may be changed at the discretion of the commission.

J. W. Selby Heads Scouts And Landmen's Association

J. W. Selby, chief scout for Shell Oil Company, Houston, was elected president of the National Oil Scouts & Landmen's Association when that group concluded its annual convention May 31. He succeeds C. J. Bradley, The Texas Company, Tyler, Texas, who automatically becomes board chairman.

Other officers named were: John V. Melton, The Atlantic Refining Company, Shawnee, Oklahoma, first vice president; M. A. Ricketts, Sinclair Prairie Oil Company, Corpus Christi, second vice president; A. G. Schuler, Arkansas Pipe Line Company, Longview, secretary-treasurer, and Edward C. Harman, Seaboard Oil Corporation, Dallas, editor-in-chief.

Texas ASM Schedules Barbecue June 14

The Texas Chapter of the American Society of Metals will hold its fifth annual stag barbecue during the afternoon and evening of June 14 at The Oaks, Clear Lake Shores, near Sea Brook. The sports program includes baseball, swimming and horse shoe and washer pitching, with indoor games scheduled for the evening.

NORMAN L. DEUBLE, assistant to the vice president of Copperweld Steel Company, Warren, Ohio, has been appointed manager of sales. A graduate of Case School of Applied Science, he was with Republic Steel Corporation, Central Alloy Company, and United Alloy Steel Company before joining Copperweld.

Gasoline Goes to Market; Fuel Oil Shipments Lag

Statistics of the industry currently are being watched particularly for any evidence of drafts on stocks on the Atlantic Coast and for backing up of products and crude in storage on the Gulf Coast, in reflection of the scarcity of tanker tonnage.

Latest statistics, covering the week ended May 31, furnished some reflection of the tanker situation, having indicated that available tanker space was being used freely in moving gasoline but that movement of fuel oils and crude coastwise was lagging. Shippers apparently were concerned primarily with laying down gasoline on the East Coast in advance of the heavy consuming period and to less extent with the currently less urgent need for heating oil in that region.

Gasoline continued to move in large volume to the East Coast, and stocks of finished and unfinished materials in that area increased from 21,157,000 to 21,657,000 barrels—an even half million barrels; while those of the Appalachian district rose from 2,957,000 to 3,082,000 barrels. On the Texas Gulf Coast, meanwhile, stocks decreased from 14,630,000 to 14,119,000 barrels, and those on the Louisiana Gulf Coast came down from 3,489,000 to 3,420,000 barrels.

In contrast with the accumulation of gasoline in storage on the East Coast there was a withdrawal of 700,000 barrels in the Illinois-Indiana-Kentucky district, stocks having decreased from 17,700,000 to 17,007,000 barrels. In the Oklahoma-Kansas-Missouri region, likewise, stocks came down, having declined from 8,179,000 to 7,874,000 barrels. Inland Texas showed a decrease from 2,342,000 to 2,281,000 barrels and the Rocky Mountain area from 1,692,000 to 1,663,000 barrels. Small increases occurred, meanwhile, in North Louisiana-Arkansas and in California.

In contrast with the half million barrel accumulation of gasoline in storage on the East Coast in the week ended May 31, there was in the corresponding week last year a 15,000 barrel reduction of stocks.

For the United States as a whole, the stocks of finished and unfinished gasoline came down almost an even million barrels in the week of May 31, having decreased from 94,811,000 to 93,845,000 barrels. The latter quantity was approximately 7,000,000 barrels (7 percent) smaller than that of 100,946,000 barrels on hand a year previously.

Present stocks of aviation gasoline (7,460,000 barrels) are 2,000,000 barrels larger than those held a year ago. The present inventory of ordinary gasoline (86,385,000 barrels) is 9,000,000 barrels (9.5 percent) smaller than that on hand a year ago (95,443,000 barrels).

Stocks of Heating Oil

Total stocks of gas oil and distillate fuels in the United States on May 31 were 33,524,000 barrels, 422,000 barrels having been added to storage within the week ended on that date. The new total was 5,405,000 barrels (19 percent) larger than that held at the corresponding time last year.

As compared with the 422,000-barrel addition to stocks for the week, there was an increment of about 700,000 barrels in the corresponding week a year ago.

On the East Coast, stocks of gas, oil and distillate decreased in the week ended May 31 from 9,122,000 to 9,060,000 barrels, while those in the Appalachian region came down from 379,000 to 356,000 barrels. On the Texas Gulf Coast, the stocks of light fuel oils increased from 6,043,000 to 6,601,000 barrels, and on the Louisiana Gulf Coast they rose from 1,233,000 to 1,247,000 barrels.

Inventories of gas oil and distillate fuel increased in the week of May 31 from 2,883,000 to 3,057,000 barrels in the Indiana-Illinois-Kentucky region and from 1,284,000 to 1,343,000 barrels in Oklahoma-Kansas-Missouri. In California, there was a 300,000-barrel withdrawal, as stocks came down from 10,685,000 to 10,372,000 barrels.

Heavy Fuel Oil Storage

The million barrel reduction in stocks of residual fuel oil in the week of May 31, resulted primarily from continued heavy draft on stocks in California. For the United States as a whole, residual fuel oil storage decreased from 93 774,000 to 92,757,000 barrels, and the latter quantity was more than 10,000 000 barrels (10 percent) under the total on hand a year previously (103,079,000 barrels). This reduction of the past year has occurred in California, stocks in the remainder of the country being several millions of barrels larger than a year ago.

In the week ended May 31, stocks of residual fuel oil on the East Coast were reduced from 8,467,000 to 8,012,000 barrels, and those of the Appalachian region came down from 470,000 to 432,000 barrels. The stocks were virtually unchanged meanwhile in Indiana-Illinois-Kentucky and in Oklahoma-Kansas-Missouri. Inland Texas showed a small withdrawal. Stocks increased on the Texas Gulf Coast from 6,975,000 to 7,221,000 barrels, but they decreased on the Louisiana Gulf Coast from 1,659,000 to 1,493,000 barrels. In California, there was a 550,000 barrel withdrawal, from 66,820,000 to 66,263,000 barrels.

Runs to Stills Reduced

After having reached a new all time high of 3,867,000 barrels daily in the previous week, crude runs to stills came down to 3,699 000 barrels daily in the week ended May 31, and at that level were only 2.6 percent above the daily average of May last year. The sharp curtailment of plant operations apparently reflected primarily the inadequacy of tanker tonnage for keeping crude oil and products moving steadily out of the Gulf Coast, as runs at Coastal Texas

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[2]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[3]278,607,000	86,216,000	26,167,000	108,597,000
August 5	[3]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[5]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[2]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,273,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	[1]48,893,000	108,475,000
November 9	3,584,200	3,510,000	261,631,000	[6]79,847,000	48,408,000	107,687,000
November 30	3,335,050	3,510,000	262,679,000	80,284,000	46,212,000	106,618,000
December 28	3,385,500	3,585,000	261,552,000	83,274,000	42,266,000	102,620,000
1941:						
January 25	3,599,100	3,625,000	260,093,000	88,762,000	39,039,000	100,297,000
February 22	3,629,650	3,590,000	261,783,000	95,812,000	34,381,000	98,631,000
March 1	3,632,250	3,585,000	263,176,000	96,917,000	33,725,000	97,510,000
March 29	3,746,550	3,625,000	266,187,000	[2]99,727,000	29,949,000	96,152,000
April 26	3,726,850	3,675,000	266,149,000	96,647,000	29,543,000	94,732,000
May 3	3,507,100	3,735,000	265,728,000	96,328,000	30,309,000	94,414,000
May 10	3,756,100	3,821,000	263,994,000	95,703,000	31,548,000	94,407,000
May 17	3,784,450	3,805,000	262,645,000	94,867,000	31,882,000	93,987,000
May 24	3,772,850	[1]3,867,000	261,576,000	94,811,000	33,102,000	93,774,000
May 31, 1941	3,786,100	3,699,000	.....	93,845,000	33,524,000	92,757,000
May 31, 1940	3,749,050	[8]3,607,000	[4]259,330,000	100,946,000	28,119,000	103,079,000
Change in past year	+1.0%	+2.6%	+0.9%	−7.0%	+19.2%	−10.0%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, May 25, 1940.
[5] Lowest since October, 1922, due to shut down of six mid-continent states. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] May, 1940, daily average.

Wholesale Prices of Refined Products in Principal Markets

REFINED GASOLINE	Range Last Week (Cents a gal.)		Changes from Week Before	
Oklahoma Refineries:				
60 Octane and under	5	5⅜	+¼	...
63-66 Octane	5⅜	5⅝	+¼	...
72-74 Octane	5⅝	6⅛	+⅛	...
80-82 Octane, Ethyl	6¼	7⅛	...	...
Mid-Western Tank Car:				
60 Octane and under	4⅞	5⅜	+⅛	+⅛
63-66 Octane	5⅜	5⅝	+¼	+⅛
72-74 Octane	5⅝	6⅛	+⅛	...
80-82 Octane, Ethyl	6⅞	6⅞	...	...
New York Harbor:				
68-70 Octane	8	8	+½	+½
72-74 Octane	8	8½	+½	+½
Min. 80 Octane, '39 Research	8	9	...	+½
Gulf Coast:				
60 Octane unleaded	5	5¼	...	...
65 Octane unleaded	5¼	5½	...	...
68 Octane unleaded	5⅝	6	...	...
70 Octane unleaded	5¾	5¾	...	—¼
72-74 Octane leaded	5⅝	6	...	...
Min. 80 Octane, '39 Research	5⅝	6¼	...	...
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	3⅜	3⅜	...	...
F.O.B. Breckenr'ge, Tex.	3	3	...	—⅛
KEROSENE				
Oklahoma Refineries:				
41-43 water white	4⅜	4¾	...	...
42-44 water white	4½	4⅞	...	...
Mid-Western Tank Car:				
41-43 water white	4⅜	4¾	...	...
42-44 water white	4½	4⅞	...	...
New York Harbor	5½	5¼	...	...
RANGE OIL				
At Oklahoma Refineries	4	4⅜	...	...
In Mid-Western Market Group 3, basis	4	4	...	...
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3½	4¼	...	...
No. 3	3⅜	3⅜	...	...
Mid-Western Tank Car:				
No. 1 white	3¾	4⅛	...	...
No. 3	3¼	3½	...	...
New York Harbor:				
No. 1	5¼	5¼	...	...
No. 3	4⅞	4⅞	...	...

HEAVY FUELS	Range Last week (Per Bbl)		Changes from week Before	
Oklahoma Refineries:				
No. 6	$0.75	$0.80	+.05	...
Mid-Western Tank Car:				
No. 5	.85	.85	...	...
No. 6	.80	.85	...	...
New York Harbor:				
No. 5	1.55	1.65	...	...
No. 6	1.25	1.35	...	...
BUNKER C FUEL OIL (Per barrel, ships' bunkers)				
Gulf Coast	$ .85	$ .90	...	...
New York Harbor	1.25	1.35	...	...
DIESEL OIL (Per barrel, ships' bunkers)				
Gulf Coast	$1.45	$1.50	...	...
New York Harbor	2.00	2.00	...	...
Los Angeles Basin, 27 gravity	1.15	1.25	—.05	...
LUBRICATING OIL (Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	16½	17½	...	...
Neutral oil pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	9½	11¼	...	...
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	21	23	+1	+2
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	27	30	...	...

refineries dropped from 100.7 percent of rated capacity to 91.8 percent—a reduction of 85,000 barrels, from 962,000 to 877,000 barrels daily; while on the East Coast, plants cut runs from 94 to 89 percent of capacity, that is, from 603,000 to 574,000 barrels daily. Inland Texas plants also slowed down, having operated at 72 percent of capacity, compared with 81 percent the previous week, a decrease of 16,000 barrels daily, from 136,000 to 120,000. In California, plants cut runs from 75 to 72 percent of capacity, having charged to stills 525,000 barrels of crude daily, compared with 545,000 daily the week before.

In the Middle West and in the Mid-Continent, too, runs to stills were somewhat curtailed, and in those areas, the reason may have been tightness of supplies of crude, as evidenced by the fact that withdrawals of crude from storage have been proceeding in large volumes, with current production short of the current refinery requirements.

Gasoline Prices Rise Further; Michigan Crude Postings Up

Markets retained their strength last week, and there were some further increases in prices of products and of crude oil.

Advances of product prices were confined, chiefly, however, to gasoline, and even that product was largely unchanged on the Gulf Coast, apparently in reflection of uncertainties surrounding the availability of tankers.

On the Atlantic Coast, conversely, prices were further marked up sharply, as those holding supplies anticipated

United States Crude Output Up 36,650 Barrels

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (May)	State Allowable (Barrels Daily in May)	BARRELS DAILY FOR WEEK ENDED May 31	June 7
TEXAS—				
Texas Panhandle	...	...	78,100	74,500
North Texas	...	...	99,600	99,700
West Central Texas	...	...	30,100	30,200
West Texas	...	...	258,700	261,100
East Central Texas	...	...	78,900	80,500
East Texas Field	...	...	374,200	372,800
South Texas	...	...	210,300	210,400
Texas Gulf Coast	...	...	275,500	275,600
Total Texas	1,371,700	1,362,280§	1,405,400	1,404,800
CALIFORNIA—				
Long Beach	...	...	43,300	41,600
Midway-Sunset	...	...	43,100	50,900
Kettleman Hills	...	...	35,800	34,200
Wilmington	...	...	81,400	83,200
Others	...	...	422,100	419,200
Total California	615,300	575,000*	625,700	629,100
OKLAHOMA—				
Oklahoma City	...	...	87,800	95,950
Seminole Area	...	...	107,650	108,050
Others	...	...	217,975	217,575
Total Oklahoma	459,700	415,000	413,425	421,575
ILLINOIS—				
Salem	...	...	91,000	91,800
Louden	...	...	60,000	61,500
Centralia	...	...	10,500	10,900
Other New Pools	...	...	146,900	169,200
Old Pools	...	...	11,800	12,400
Total Illinois	345,300	...	320,200	345,800

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (May)	State Allowable (Barrels Daily in May)	BARRELS DAILY FOR WEEK ENDED May 31	June 7
LOUISIANA—				
North Louisiana	...	...	73,300	73,500
South Louisiana	...	...	252,500	250,700
Total Louisiana	319,700	319,500	325,800	324,200
KANSAS	220,400	232,400	208,900	201,650
NEW MEXICO	113,000	113,000	113,300	113,200
EASTERN STATES—				
Pennsylvania Grade	48,000	...	71,500	74,900
Others, Eastern	52,300	...	19,000	18,700
Total Eastern States	100,300	...	90,500	93,600
MOUNTAIN STATES—				
Wyoming	89,300	...	81,300	84,500
Montana	19,700	...	19,100	19,000
Colorado	5,000	...	3,800	3,900
Total Mountain States	114,000	...	90,500	107,400
MICHIGAN	38,000	37,500†	37,800	38,200
INDIANA	22,000	...	20,500	21,800
ARKANSAS	83,000	73,612	73,400	73,300
MISSISSIPPI	23,300	...	25,700	27,000
NEBRASKA	4,300	...	4,350	4,200
‡Total 8 Prorated States	3,220,800	3,128,292	3,203,725	3,206,025
Total United States	3,830,000	...	3,769,175	3,805,825

* Recommendation of Conservation Committe of California Oil Producers.
† Estimate of actual production under prescribed regulations, which do not fix a definite state total allowable.
‡ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.
§ Texas Railroad Commission's estimate of actual net daily production, allowing for usual under-production of 3½ percent under net allowable, which at the beginning of June is calculated at 1,411,732 barrels daily. However, allowable normally increases as new wells are completed. Under June order, most Texas fields were ordered shut down June 1, 7, 8, 14, 15, 21, 22, 28 and 30. Panhandle was was ordered shut down June 7, 14, 21, and 28.

difficulties of replacement. Both highs and lows of price ranges of suppliers advanced ½ cent a gallon, despite the material gains already recorded in the past several months.

At Oklahoma refineries, minimum prices of gasoline were ⅛ cent a gallon higher than a week previously, although the highs of asked prices remained unchanged.

In the Middle West, however, advances of ⅛ cent a gallon were general and applied to all grades and to the quotations of virtually all refiners and resellers.

Natural gasoline, following improvement in recent weeks, remained generally unchanged in price.

Kerosene and heating oil were not particularly active, and prices remained generally the same as previously in all markets of the country.

Heavy fuel oil continued in steady demand, and there was a 5-cent-per-barrel advance in the minimum quotation on No. 6 oil at Oklahoma refineries, although prices remained unchanged in other markets.

Lubricants came into even greater demand than previously, and prices of bright stocks were marked up 1 to 2 cents a gallon in Western Pennsylvania, while neutrals were advanced 1 cent a gallon in that region. In the Mid-Continent, refiners continued to ask previously established prices for both bright stocks and neutral oils.

The gradual improvement of crude-oil prices was continued when postings for southwestern Michigan shallow, Traverse sand fields advanced from $1.38 to $1.45 a barrel, effective June 4, in conformity with the 7-cent raise for the basin fields on May 27. The shallow fields account for approximately 40 percent of the state's 37,000-barrel total daily production. Adams-Arenac County prices also were advanced, having been raised from $1.25 to $1.27 a barrel.

The increase of Michigan crude prices obviously reflected the continuing decline of production in both Illinois and Michigan.

Illinois Increase Largely Causes Rise in Production

United States crude oil production averaged 3,805,825 barrels daily in the week ended June 7. That was 36,650 barrels a day more than output in the previous week, but 24,175 less than market demand, as estimated by the United States Bureau of Mines.

Primarily responsible for the week's increase was a 25,000-barrel gain in production of miscellaneous Illinois new pools, which caused that state's output to rise to 345,800 barrels daily from 320,200 the previous week. At the new rate, Illinois fulfilled market demand for its crude, as estimated by the bureau.

California production rose 3400 barrels to 629,100 daily, and was 14,000 barrels above estimated demand.

Oklahoma showed an increase of 8150 barrels in averaging 421,575 barrels daily, but the latter figure was 38,125 barrels short of indicated market demand for Oklahoma crude.

Texas production was virtually the same as in the previous week at 1,404,800 barrels daily, and at that level was 33,100 barrels daily above indicated demand. Louisiana showed a decrease of 1600 barrels, having averaged 324,200 barrels a day. Kansas output was off 7250 barrels at 201,650 barrels daily.

Pipe Lines

Gulf to Add 10,000 Barrels To Oklahoma-Indiana Line

Gulf Refining Company will increase capacity of its oil line between Glenn pool, Oklahoma, and Dublin, Indiana, by 10,000 barrels. Construction will consist of 12 loops of 10-inch pipe totaling 200 miles. This is the first major step to relieve threatened shortage of crude on Atlantic seaboard, enabling greater quantities of crude from Texas and the Mid-Continent areas to be piped north eastward.

Following completion of these series of loops, capacity of this system will have been increased from 43,000 barrels daily to 53,000 barrels daily.

Present artery between the company's Perryman station at Glenn pool, and Dublin consists of 732 miles of 10-inch. In 1936 capacity was increased from 32,000 to 43,000 barrels by construction of 297 miles of loops. Oil is delivered to Toledo, Cincinnati and Pittsburgh.

Construction will begin early in July.

Digging Up Shreveport Pipe Line to Ship to Venezuela

Bender Company of Shreveport is digging up a 10-inch welded oil line, 86 miles long, extending from Shreveport to Louann, Arkansas. The line was formerly owned by The Texas Company which several months ago dismantled its tank farm at Shreveport. The line was laid 16 years ago. About 50 miles of the pipe will be shipped to Venezuela and the rest disposed of in domestic fields.

Hearings on Michigan Pipe Line Project Open June 10

Hearings will open June 10 in Lansing before the Michigan Public Service Commission on companion applications of Consumers Power Company and Panhandle Eastern Pipe Line Company for permits to carry out a $4,000,000 to $6,000,000 pipe-line construction and gas-marketing program.

Panhandle has contracted with Consumers to supply from 10 to 20 billion feet of natural gas annually from its Texas and Kansas connections for new Michigan services where Consumers has the marketing franchises. Industrial cities, such as Flint, Pontiac, Jackson and Kalamazoo are included in the 66 cities and towns that will be converted to natural gas if permits are approved.

The plan will require construction of 250 miles of 18- to 22-inch diameter pipe line to be built by Panhandle.

Consumers now buys and sells about five billion feet of Michigan natural gas annually to other cities including Lansing, Saginaw and Bay City. Not enough Michigan gas is available, Consumers officials said, to warrant expansion into new markets without both the supply and reserves that Panhandle can supply. Panhandle has been supplying the city of Detroit 90 to 100 million feet per day at the peak since 1937.

According to Consumers, the contract with Panhandle protects Michigan gas producers through a proviso stipulating that Michigan gas, if and when available, can be cut into the system.

A preliminary reaction to the big Texas gas program in Michigan from gas producers was favorable to the program. Those that expressed opinions said they believed that it was the only way that further market expansion could be achieved and that because of transportation costs, Michigan gas always would have an edge over an imported supply.

Stanolind Building Loops On Line to Chicago Area

Stanolind Pipe Line Company awarded contract for construction of 9 miles of 14-inch and 8 miles of 18-inch oil lines to loop dual lines to the Standard Oil Company (Indiana) refinery at Whiting, Indiana. This work is primarily for segregation of three grades of crude rather than for substantially increased capacity.

Contracts Let on Gas Line To Magnolia Refinery

Magnolia Petroleum Company awarded contracts to the O. C. Whitaker Company, Fort Worth, and Williams Bros. Corporation, Tulsa, for laying a 103-mile natural gas line from West Ranch field, Jackson County, Texas, to the company's Beaumont refinery. The line will have a capacity of 50,000,000 feet daily without use of boosters, and is scheduled to be in service November 1. Williams Bros. Corporation will start work June 15 laying 69 miles of 14-inch and 30 miles of 16-inch line on the Beaumont end, while the other contractor is scheduled to begin work July 15 on the remaining 94 miles of 14-inch.

North Texas Line

Sinclair Refining Company awarded contract to Monarch Construction Company for construction of 5.3 miles of 4-inch line from its Walnut Bend-Muenster carrier in Cooke County, North Texas, to the Anderson-Kerr pool, which is producing 1000 barrels of high-gravity oil daily. This new line is to be in operation by June 18. The company will remove 8 miles of 4-inch loop on the Walnut Bend-Muenster line to get pipe for the Anderson-Kerr pool, outlet cutting the welded pipe in double joints.

Kansas Line

Contract has been awarded J. R. Stewart Construction Company by Texas-Empire Pipe Line Company for construction on a trunk line in Sedgwick County, Southern Kansas. This consists in the removing of 8 miles of 12-inch and the laying of 8 miles of 10-inch. Work will begin immediately.

Short Oklahoma Line

Howard J. Sherman and associates have completed a short 4-inch crude oil line from Hobart pool, Kiowa County, Oklahoma, to a loading rack at Hobart. Stanolind Oil Purchasing Company is taking the crude by tank cars from Hobart to their Tribbey station, to be put into the line at that point.

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U. S. FIELD OPERATIONS

Illinois Basin

Franklin County Wildcat Indicates Small Pool

Small pool indicated by Franklin County wildcat; extensions loom for Washington and Richland County areas, and water encroaches in Louden pool Devonian well.

Franklin County: E. S. Adkins' Old Ben Coal Co. 1-F, 6 miles south Benton field production, NW SE 36-7s-2e, twice perforated McClosky 2906-21 ft; swabbed 5 bbls day; estimated 40-bbl well after acid.

Extensions: Powell-Risk's Holle 1, NW NW NE 15-1s-1w, ½ mile north Irvington field, Washington County, waited on cement with pipe at 1521 ft to test Benoist 1521-27 ft; Cypress 1412 ft had saturation. Jack Davis et al's Sam Shan 1, W½ SW NW 27-3n-9e, ½ mile east production in Decker Township, Richland County, recovered 11 ft fair to tight McClosky below 3058 ft, waiting on cement.

Louden Devonian Water: Whisenant & Trenchard's Lilly 25-D, NW SE 16-8n-3e, which touched off Devonian campaign with 600-bbl daily production, cutting 1 percent water, cut 30 to 35 percent water and shut in. Several tests drilling to Devonian.

Benoist in Effingham: Lynch & Jackson's Burk 1, W½ SE NW 26-6n-5e, mile south McClosky oil in Mason pool, pumped 170 barrels first 20 hours natural, 2274-2302 ft, for first Benoist oil in Effingham County. A drilling flurry has started.

Scattered Wildcats: Blackstock et al's Cox 1, NE NW SE 2-8s-9e, Gallatin County, topped Glen Dean 2300 ft, Benoist 2717 ft; recovered saturation Rosiclare and McClosky; prepared to drill plugs. Potter's Sutton 1, SE SE SW 28-8s-7e, near Eldorado, Saline County, casing cemented above Palestine saturation 1945 ft, bottomed 1956 ft. Jack Chevigny's J. H. Phillips 1, SW NW SW 26-6s-6e, Hamilton County, Pure Oil Co. farmout, drilling 2980 ft. Smith Petroleum Co.'s Mittendorf 1, SW SW SE 8-2s-4w, Washington County, ran structurally high but found Cypress, Benoist, Aux Vases and McClosky dry; drilling 2100 ft toward Devonian. Schwartz's Studebaker 1, SE SE SW 21-6n-2w, Bond County, topped Glen Dean 695 ft, Benoist 986 ft, St. Genevieve 1066 ft; drilling 1184 ft.

Indiana

A Posey County wildcat prepared to test Aux Vases saturation, and Knox County's St. Thomas pool McClosky discovery got an offset.

Posey County: Whisenant & Trenchard's F. McFadden 1, SW NW SW 16-6s-14w, Black Township wildcat, prepared to drill plug to Aux Vases at 2800-11 ft. Mahutska Oil Co.'s Holmans 1, NW SW NW 5-4s-13w, set casing to Cypress, topped 2465 ft; John R. Less set surface casing in Schreiber 1, NW SW SW 27-6s-13w, Black Township; Kenneth Yost and Arch Dye's Allen 1, NW SE SW 14-7s-14w, 2½ miles southeast Mt. Vernon, drilled below surface casing.

St. Thomas Pool: Midwest Development Co. spudded Schaller 1, SE SE SE 23-2n-11w, west offset to McClosky discovery, to revive St. Thomas pool interest.

Gibson County: Ward Wickwire's Davis 1, SW SW SE 8-2s-12w, 5 miles south Mt. Carmel, Illinois, drilled below 650 ft towards McClosky; Illinois-Indiana Production Corp. set surface casing in Stratman 1, NW NW 14-4s-10w, 2 miles east Warrenton, Carter Oil Co. farmout 1½ miles southeast dry hole.

Scattered Wildcats: Kenn-Penn Oil Corp. located Walter Metz 1, SW NW 10-6s-7w, near Midway, 5 miles southeast Boonville, Warrick County, mile east of dry hole, to be cable-tooled to McClosky. Southwestern Development Co.'s G. Carpenter 1, NE SW 19-1n-6w, near Iva, Pike County, drilled below 300 ft.

Oklahoma

Simpson Shows Oil Well In Caddo County Wildcat

Discovery geologically flanking Wichita uplift sparks extensive Caddo County play, Western Oklahoma, new horizons proven Centrahoma structure, Coal County, North Little River pool, Seminole County.

Caddo County: Texas Co.'s Smith 2, C SE NW 2-5n-12w, 4 miles northwest Apache, on drill-stem test, packer 3388 feet in Simpson 3360-3410 ft, after first 5 minutes flowed gas, after 50 minutes flowed oil rate 250 barrels 40-gr hourly with 1.5 million ft gas; 7-in set 3380 ft; bottom-hole pressure 1500-2000 pounds. Two days later blew uncontrolled gas estimated 50 million ft between flow string and surface pipe, gas entering from Hunton-Sylvan zone 2000-2400 ft. Operators control 12,000 acres surrounding discovery, with Caddo County blocks totaling 30,000 acres. Location between depositional areas Anadarko and Ardmore Basins, but largely influenced geologically by upthrust Wichita-Amarillo Mountains. Initial test by Texas Co. ¼-mile north completed 3 million feet gas Viola lime 2966 ft, encountering two sections in 1170-ft section.

New Pays: Ramsey Petroleum Corp.'s Harryman 1-A NW SE NW 27-2n-9e, Centrahoma pool, Coal County, McAlester sand as pay zone, perforated 135 holes 1245-78 ft, 8.27 million ft gas, perforations 63 holes 1206-27 ft increased gas to 10.6 million ft; shut in casing pressure 550 pounds; no pipe line outlet. Centrahoma originally gas-distillate from Cromwell sand.

W. A. Delaney had initial Hunton lime oil North Little River pool, Seminole County; Harjo 1-A, SW NE SE NW 30-8n-7e, flowed 522 bbls oil 24 hours through tubing, Hunton lime 4150-70 feet. Wilcox pay defined Atlantic Refining Co.'s Johnson 1, NWc SW 29-8n-7e, plugging sand 4317-33 feet.

Stephens Wildcat: Third squeeze cementing job completed Skelly Oil Co. et al's Frensley 4, C NE NE 35-1s-5w, deep Velma test, Stephens County; 1100 sacks used; operators to perforate Bromide sand 7142-94 ft where drill-stem test showed 50 to 100 bbls crude per hour; hole bottomed 7803 feet, 5½-in casing 7791 ft. Amerada Petroleum Corp. staked Frensley 1, SW NW SW 25-1s-5w, ¼-mi northeast above test to seek Bromide production.

Roy Starr Oil & Gas Co.'s Crouse 1, NE SE NE 7-6n-13w, Caddo County, 12 miles northwest Apache discovery, farmout from Amerada Petroleum Corp., dry 1156 ft in Simpson sand. Logged gas 405-410 ft, Conglomerate 880-963, Granite Wash 980-1090 ft, show gas, slightly stained oil sand 1150-56 ft.

Kansas

Extension Given Greenvale Pool, Russell County

Russell County's Greenvale pool was extended, while wildcatting in Phillips, Barton, Stafford and Cowley Counties increased.

Russell County: Phil-Han Oil Co.'s Soukup 1, NWc SW 3-15-12w, filled 200 barrels hour, 10,000 gallons acid, Lansing-Kansas City lime 2949-3031 ft; extends Greenvale pool. Cities Service Oil Co.'s Stoppel 1, NW NE SW 17-14-11w, 5 miles northeast Greenvale pool, derrick and pits, while company's Beisel 1, NEc NW 15-14-12w, between Greenvale and Bunker Hill pools; topped Anhydrite 650 ft, Fort Riley 1580 ft, drilling 3200 ft.

Phillips County Wildcats: H. L. Wirick et al's Friebus 1, C W½ SW NW 36-2-19w, 18 miles north Ray pool, drilling rotary hole, Lario Oil & Gas Co.'s Lynch Estate 1, C S½ SE SW 24-4-20w, 9 miles northeast Ray pool, below 1500 ft; Helmerich & Payne et al's Loyd 1, C S½ SE SE 6-4-17w, 2½ miles southeast Phillipsburg, rotating 2700 ft.

Barton County Wildcats: Armer & Vernon Oil & Gas Co.'s Redetzke 1, C S½ SW NW 5-16-11w, 1½ miles west Davidson pool, drilling 2300 ft; R. H. Shields et al's Kimpler 1-A, C W½ NW NE 31-18-11w, 5 miles southwest Bloomer pool, drilling 1500 ft.

Stafford County Wildcats: Three miles south Drach pool, Stanolind Oil & Gas Co.'s Ahnert 1, C E½ NE SE 26-22-13w, drilling 1000 ft; W. P. Faulkner et al's Wark 1, C E½ SE SW 21-21-13w, Gales area, drilling rotary rig; W. W. W. Drilling Co. et al's Wilson 1, C W½ NW NW 5-25-14w, 3 miles northwest Jordan pool, drilled 3840 ft, lost hole, to skid rig.

Cowley County Wildcats: Magnolia Petroleum Co.'s Banta 1, C S½ SE NE 26-30-5e, mile northwest Eastman pool, rotary rig; Steinbuchel & Berger's Peck 1, C N½ NW SE 23-34-5e, 1½ miles southeast Rahn pool, drilling 750 ft; Miller et al's Tonkinson 1, C W½ SW NW 17-33-5e, 4 miles southeast Winfield, spudded, and Marylyn Oil Co.'s

Mosier 1, NEc SE 20-34-7e, 5 miles northwest Olson pool, rig.

Scattered Wildcats: Alva Billings et al's Ryan 1, C E½ NE SE 27-8-32w, Thomas County, 1000 gallons acid, 4283-95 Lansing lime testing. Previously, hole water 4373 ft, 6-in casing 4283 ft, may deepen.

Promising to revive abandoned Ellsworth pool, adjoining townsite, Ingling & Parker's State 1-A, C SW SW 29-15-8w, showed gas 2174-80 2218-27, 2364-66, 2384-86, 2400-20, 2496-2500 ft, bottomed 2555 ft; cemented 4½-in 2555 ft; Topeka lime topped 2194 ft, to perforate all shows.

Nebraska

Deeper Pay at Falls City Should Stimulate Drilling

Deeper pay was proven at Falls City, Richardson County. Sustained wildcatting effort continues in Richardson, Gage and Nemaha counties.

Richardson County: Ohio Oil Co. and Harry Harper's Sibbernsen 1, C N½ NE NE NW 20-1n-16e, Falls City, flowed 800 bbls, pinched in; second break in Hunton perforated 24 holes 2281-85 ft after original pay 2250-56 ft showed water with oil. Bottomed 2896 ft in Viola, plugged back 2445 ft. Structurally highest well in pool. Requiring no acid, strike should give impetus to drilling; northwest offset staked.

J. E. Palensky et al's Kalous 2, SWc 5-2n-13e, had Lansing 473 ft, drilling 1500 ft. Midland Oil Co. et al's Gebhard 1, NEc 1-2n-15e, 6 miles north Falls City, topped Lansing 1003 ft, drilling 2100 ft.

Gage County Wildcats: Nelson Bros.' Ideus 1, C W½ E½ SW 5-3n-7e, drilling 500 ft. Walt Rider et al's Warren 1, C NE NE 21-3n-5e, shut down 2858 ft; may test Hunton 2535-40 ft, Viola lime 2605-30 ft. Temporarily shut down, C. A. Nuttle et al's Taylor 1, NEc SW 15-3n-6e, 265 ft; S. F. Miller et al's Bethoud 1, C E½ NW SW 2-4n-6e, 753 ft, small oil show 608 ft.

Scattered Wildcat Activity: Bumpus et al's Achen 1, C S½ SE SW 12-4s-14e, 6 miles north Wetmore, Nemaha County, had Bartlesville 1775-1810 ft; sand show gas 2287-99 ft; 6-in 2300 ft, drilling 2450 ft. In northeastern Kansas, Jock Garden et al spudded Elliott 1, C E½ SE SW 31-3s-20e, Doniphan County; McAlpine et al's Tyler 1, NE SW SW 4-3s-15e, Brown County, drilling 1325 ft.

Shell Awards Contract to Double Toluene Output

Shell Oil Company last week announced award of a contract for erection of an additional petroleum toluene plant at its Houston refinery.

According to Dr. R. H. Waser, manager of the Houston refinery, this plant will be a duplicate of the first petroleum toluene plant, which went into operation last December. The combined capacity will be 4,000,000 gallons of toluene per year, from which about 40,000,000 pounds of T.N.T. can be manufactured.

Contract for the new plant has been awarded to the C. F. Braun Company, Alhambra, California, and is expected to be completed by October 1.

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West Texas

Third Deepest West Texas Hole Sets Pipe for Test

Third deepest West Texas test uncovered adequate oil porosity and saturation in Ordovician to warrant landing pipe for production test; Soma-Noelke shallow pool, Crocket County, was given a major extension, and group of Abell pools wells, Pecos County, developed gas from Simpson.

Deep Projects: Amon G. Carter's Wasson 4-D, NWc SE PSL Sec. 50, Block AX, Gaines County sector Wasson field, was to run 5½-in near bottom for swabbing test of 2 promising zones. Porous lime at 11,100 ft, tentatively identified as Ellenberger or lower Ordovician, another prospective producing zone near 11,050-ft level will be cased off and tested later. It passed several oil zones in middle Permian to explore Ordovician, paving the way for completion of Carter's Wasson 5-D, 1760 feet south, from broken lime at 6210-6881 ft. Wasson 4-D is near top of the structure and is credited with entering Pennsylvanian 8900 ft, Devonian 9980 ft, with elevation 3564 ft.

Humble Oil & Refining Co. et al's Byrd 1, 2 miles northeast Petersburg, southeastern Hale County, was drilling coal and shale 5800 ft, with Ordovician as objective. Phillips Petroleum Co.'s University-Andrews 1, northeast outpost Embar gas area, Andrews County, was fishing drill pipe, 8230 ft, while Magnolia Petroleum Co.'s Ralph 1, wildcat west central part county, was drilling 3852 ft. In Reagan County, Amerada Petroleum Corp.'s University 1-R-A was drilling 6565 feet. Magnolia's Walton-State 20, Winkler County semi-wildcat between Keystone and Kermit areas, was at 4552 ft, seeking Lower Permian production.

Crockett County: Wilshire Oil Co.'s Thompson 1, southeast corner Sec 58, Blk GG, B. B. Ingham Survey, expanded oil limits of Soma-Noelke pool 1¾ miles northwest with hole full of oil from Yates sand at 1256-79 ft, elevation 2720 ft. Hole bottomed in shale at 1285 ft. Test delayed pending tankage. M. & M. Production Co.'s Bouscaren 1, midway between the pool and the above outpost, was big gasser last year from Yates at 1512-55 ft, elevation 2871 ft.

Abell field: Dry gas at varied levels in Simpson is unexpected development. George Abell et al's Rixse 1, east outpost, flowed 94 bbls oil, 60 bbls water on 28-hour gauge through ½-in choke, plugged back 5043 to 5001 ft; shut in overnight, produced gas with spray of drilling water against 1800 pounds casing pressure. Magnolia Petroleum Co.'s McKee 1, east offset was drilling shale 5541 ft after show gas 4957-75 ft and water 4988-5008 ft. Simpson is badly fractured, thus accounting for absence of Tulip Creek section and irregular water table. Magnolia's Gerety 1, north outpost, produced 2,812,000 ft dry gas daily on brief drill stem test at 5712-54 ft, and was drilling at 5875 ft. McKee-Tex-Mex 2, offsetting the most northeasterly producer, cored gray dry sand 5705 ft after show 4,227,800 ft of gas 5265-85 ft, elevation 2392 ft. The latter topped Simpson 4820 ft, Tulip Creek 4935 ft. Magnolia's Baldwin 2, same area, was rated 4,186,000 ft of dry gas

daily on brief test at 5739-51 ft, and was drilling 5790 ft.

Siemoneit Drilling Co.'s Walsh 1, east outpost for Abell pool, was testing McKee sand 4989 ft, with 7-in 4925 ft. High pressure gas flow severed discharge line on initial test. Sinclair Prairie Oil Co.'s Grove 1, 1⅜ miles east by north of discovery, is in a fractured zone, thus accounting for extremely low structural position. It was drilling at 5675 ft, elevation 2392 ft. Ordovician markers are: top Simpson 4825 ft, Tulip Creek 5095 ft and McKee sand 5413 ft. Phillips Petroleum Co.'s Silverman 2, 1320 ft west of big producer in sand 5136-60 ft, topped Simpson 4820 ft, coring 5345 ft, missed regular pay. Stanolind Oil & Gas Co.'s Conry-Davis 1, 4 miles southeast of Abell production, logged Ellenberger-granite contact at 5740-45 ft, and plugged back to 4895 ft to cement 7-in at 4830 ft. A producer is due from Permian at 3746-3817 ft. The company's Meyer-Logan 1, ¼-mile north, drilling 880 ft to try 3800-ft pay.

Wildcats: Gulf Oil Corp.'s University 1-F, Crane County Ordovician project, abandoned after testing dry at 9405-25 ft, plugged back from Ellenberger 10,629-10,658 ft. The Texas Co.'s Murphy 1, western Terry County, logged nominal porosity and saturation 5186-5225 ft, elevation 3548 ft, and was coring 5230 ft. Mascho Oil Co. has trio of wildcats in Andrews County on active list. Fisher 1 registered oil saturation at 4392-4400 ft, and was drilling at 4480 ft, while University-Texaco 1, also Shafter Lake area, topped Yates grains at 2880 ft, and was drilling 3450 ft; University-Gulf 1 logged anhydrite 1830 ft, drilling 1850 ft.

North Texas

Old Pumper Deepened to Make Producer in Ellenberger

First Ellenberger production for the Electra field materialized when Magnolia Petroleum Co.'s Fee-H&TC 65, SWc NW H&TC Sec 15, Blk 13, Wilbarger County, swabbed and flowed 65 bbls oil the first 12 hours then flowed 15 bbls next 12 hours while dismantling rig. Perforations at 2882-96 ft, with 4½-in on bottom, 3007 ft. Top Ellenberger corrected to 2994 ft. Greater oil flow will likely follow acid treatment. This new pay discovery originally completed in 1924 as pumper at 779 ft, and was deepened with rotary without difficulty. Other nearby stripper wells are due to be deepened, as it involves the shallowest Ordovician production in the district outside of Cooke County.

Archer County Strawn: Phillips Petroleum Co.'s Griffin-Johnie 1, south of production in Griffin-Kadane pool, flowed 50 bbls oil hourly on brief test after drilling plugs above sandy lime 4369-75 ft. It is the eighth producer for the area.

Clay County: L. T. Burns et al's Southerland 1, ⅝ mile northwest of Burns-Browning deep pool, flowed 61 bbls oil natural on 3-hour gauge through ¾-in, from strawn at 4490 ft; plugged back from Bend at 5322-86 ft, to complete in the regular pay. Perforations at 3792-3805 ft and 3924-39 ft yielded oil, giving the area new horizons to watch for on future tests. Bridwell Oil Co.'s Myers 2, second deep test for the com-

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FEW American military emblems have a prouder battle history than the "YD" worn on the shoulders of New England's National Guardsmen. As the 26th, or "Yankee" Division, the New Englanders were one of the first Guard outfits to see action in World War I. In the great struggle of the Aisne-Marne, they were in line for fifteen days and lost more than 5,000 men. It was the aggressive "Yankees" who finally captured Belleau and held it in the face of a heavy three day artillery fire. In the Saint Mihiel operation they were active and in the Meuse-Argonne their deeds made Ville-devant-Chaumont an heroic name. During a service of 205 days in the front line, their casualties totalled 13,664 men. Today, the New England National Guard is in camp, preparing again to stand watch over American liberties.

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pany on the Neb-Tex prospect, recovered 50 ft of brackish water when formation tester was used at 6019-98 ft in Ellenberger topped at 6078 ft; 7-inch landed 6019 ft.

Wilbarger County: Texas Co. entered the Fargo area, with initial test on the east line of Anderson 160-acre lease. In Harrold 3-pay pool, Kadane & Fidel's Orr 1, south offset to discovery dry in established pays, logged Landreth lime 3213 ft and drilling 4270 ft.

Young County Mississippian: Aggressive development program underway near L. T. Burns et al's Larimore 1-A, which scored large natural flow at 4897-4927 ft, got setback when Shell Oil Co.'s Bloodworth 1-A, north offset, showed comparatively little saturation in Mississippian, topped at 4840 ft, and entered dry Ellenberger at 5038 ft. It was coring at 5080 ft. Shell authorized Bloodworth 2-A and 3-A, making 9 tests projected. Consolidated Oil Co.-Ray Oil Co.'s Dunagan 1, mile northwest discovery, was drilling 4580 ft, and King Oil Co.-Phillips Petroleum Co.'s Daniel 9, intermediate test, drilling 1250 ft. Mississippian is new zone for district, and has a reputation for erratic performance in south Young County.

Archer County: Shell Oil Co.'s Coleman 1-C, inside test for the Shell-Coleman or Scotland deep pool, flowed 121 barrels natural on 21-hour gauge from Bend 5058-5151 ft, and increased to 217 barrels oil in 15 hours after using 3000 gallons acid. Company's D. Coleman 1-G, east outpost, drilling 3350 ft.

East Texas

Spray of Oil With Gas In Willow Springs Deep Pool

First oil production for Willow Springs deep pool, Gregg County, appeared promising when Roger Lacy et al's Horton-Dickson 1, Meredith Survey, produced between 2 and 3 million ft gas daily with spray of oil on preliminary test after using 5000 gallons acid. Production is from perforations at 7132-7296 ft in Pettit. Additional acid may be used to try and stimulate the oil yield.

Humble Oil & Refining Co. and Gulf Oil Corp.'s Fisher 1, J. Lagrone survey, was abandoned after testing Pettit and Travis Peak zones with negative results. It was carried to 7705 ft.

Van Zandt County Wildcats: F. R. Jackson & Thompson's Bruce 1, 2½ miles northwest of Myrtle Springs, logged nominal oil show in sub-Clarksville sand at 3546-51 ft, but found water in exploring Woodbine section at 4068-4112 ft. Hickok and Harry Reynolds Brown 1, 5 miles southwest Canton, abandoned 4761 ft in Woodbine topped at 4167 ft.

Wood County Wildcats: Bracken Oil Co.'s McKnight & Rosen 1, southwest corner W. R. James survey, northeast Hawkins Field, was awaiting plugging orders at 5004 ft in Woodbine series topped at 4850 ft. Ed V. Parsons et al's Bellamy 1, 4 miles southeast Winnsboro, was drilling at 4380 ft.

Smith County Wildcat: Marvin McMurrey et al's Becker 1, projected lower Trinity test for Mount Sylvan structure, temporarily halted at 3720 ft for repairs. Elevation is 610 ft.

Southwest Texas

Nueces County Wildcat Shows for Submerged Field

A Nueces County wildcat may open a submerged field in the coast district; a Lavaca County test on the Wilcox trend is favorably credited as possible pool opener; Caldwell County's Tenney Creek field obtained an extension, and another was indicated for Duval County's North Sweden field.

Coast District: Humble Oil & Refining Co.'s Aransas Bay-State 1, Tract 246, on Taylors Island 5 miles east of Aransas Pass, Nueces County, bottomed at 9565 ft, ran 5½-in pipe to 8727 ft. With another string landed at 7751 ft, 1000-ft section above 5½-in seat apparently shows most favorably for new submerged field.

Salt water persisted in deep-sand tests at Baytex Oil Corp. and Atlantic Refining Co.'s McColloch 2, northeast side McCampbell field, Aransas County, taken at 9246-70, 9177-96, 8223-28 and 7788-7810 ft. Upper levels will be tested.

West offset to Cockfield discovery in western extension to Garwood, Colorado County, W. R. Davis' L. E. Brownson, found sand about level with first well, and cored deeper. Drill-stem test 6105-12 ft yielded 2100 ft 41.5-gr oil, 167 pounds working pressure, 17 minutes, and project may be completed in this zone.

Wellington Oil Co.'s J. F. Welder 1-C, mile southwest extension test to San Patricio County's Odem field, prepared for volume test of gas with distillate coming through 12 perforations at 6715-20 ft. Shut in with 2650 pounds equalized pressure, it opened new sand.

British American Oil Producing Co.'s B. E. Ivey 3 opened a second sand for Patricio County's Midway field with ungauged gas and distillate coming through perforations at 6050-51 ft, bottomed at 6495 ft.

Enthusiasm for Seelig, Jim Wells County's newest field, dampened when Magnolia Petroleum Co.'s Laughlin 1, northeast of discovery, developed salt water on test at 5044-50 ft. Magnolia's Seeligson Unit 3 drilled below 5900 ft with minor showings at shallower levels.

Hewitt & Dougherty's Reilly 1 established production on northwest side of Refugio County's Refugio field through perforations at 2666-74 ft, plugged back from 6675 ft.

Wilcox: Shell Oil Co.'s McManus 1, Lavaca County's Brushy Creek prospect, was deepening below 8600 ft, likely some distance into Wilcox and credited with favorable showings. Lease and royalty buying continued, extending into DeWitt County.

Edwin M. Jones' George West B-3, 4 miles southwest George West, Live Oak County, was below 9500 ft on way to Wilcox, with new equipment to cope with high gas pressure in Mt. Selman and Carrizo zones. Continental Oil Co.'s George West Estate 1, near Kittie, drilled below 6300 ft. Hewitt, Dougherty & Ogden's test on Weiss ranch, Bee County, had only slight shows and thin sand stringers, and was drilling below 9100 ft. Quintana Petroleum Corp.'s Washburn 3, northwest of LaSalle County's Washburn field, was drilling at 9420 ft in Taylor series. It may go below 12,000 ft to test Cretaceous limes.

Extensions: F. W. Wiegand's J. M.

Williams 1 provided a 2400-ft northeast extension to Caldwell County's Tenney Creek field, pumping 45 barrels 35.5-gr oil daily. Chalk was topped at 2457 ft, and test stopped 4 ft in Eagleford shale at 2714 ft.

Hiawatha Oil & Gas Co.'s Frank Valle 1, San Andras Grant, is testing a possible mile extension to North Sweden field, Duval County. Drilled to 5930 ft, it found salt water in 5800-ft Hiawatha sand; plugged back to Woodley zone where drill-stem test at 4883-90 ft yielded 60 ft oil, 40 ft oil-cut mud, 20 pounds pressure in 12 minutes.

Stratton Cycling Plant Changes Ownership

Purchase of the recycling plant and producing property of the Corpus Christi Corporation in the Stratton field, Nueces County, Texas, was completed by Chicago Corporation. Previously Chicago Corporation owned a third interest and acquired full ownership from Clyde Alexander, John Shearin and W. K. Warren, Alexander will be manager under the ownership change.

Additional distillate wells will be drilled. Plant capacity will be doubled and the type of its operation changed to absorption. Stearns Roger Manufacturing Company of Denver, which built the plant, will have charge of the enlargement.

Texas Gulf Coast

Fort Bend County Wildcat Shows Possibilities in Yegua

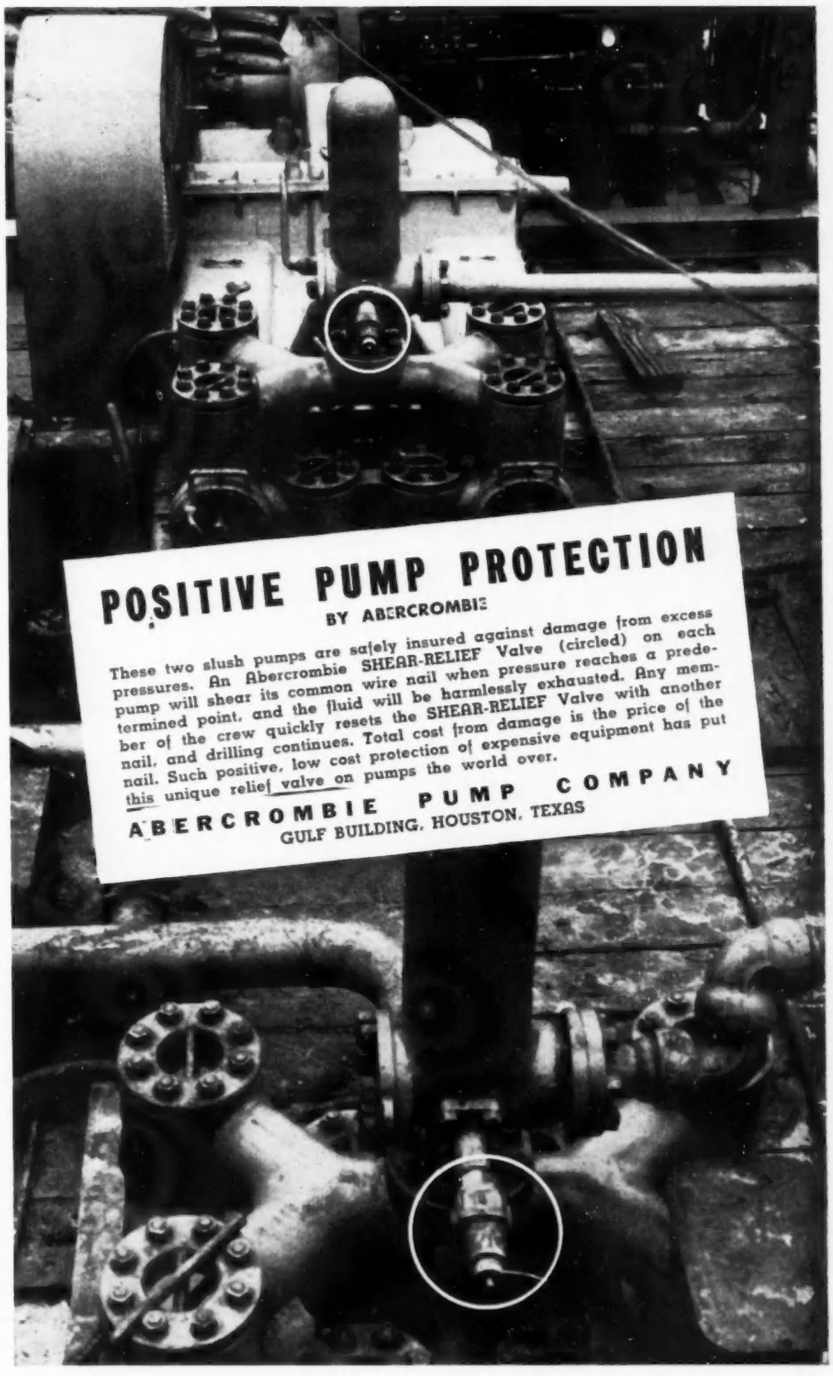
A Fort Bend County wildcat prepared to test Yegua sand, while a test west of Lake Creek discovery sought production in Wilcox.

Fort Bend County: Providence Oil Co.'s Hatfield 1, 2 miles west of Clodine, is to test of Yegua sand at 7500 ft, after upper Cockfield-Yegua showed no oil or gas. Drilled to 8090 ft, it was electric logged, cored and cased to 7580 ft. First perforations were 7497-7503 ft.

Lake Creek Area: Superior Oil Co.'s McWhorter 2, ¾ mile west of Lake Creek discovery, cored deeper in Wilcox, still above discovery pay, after drill-stem test at 9162-74 ft yielded 3 bbls oil, 30 ft salt water.

Wildcat Progress: Glenn McCarthy's Marmion 1, at Bailey's Prairie, drilled below 10,000 ft, with operators denying reports casing was to be set. David B. MacDaniel's Baldwin 1, south Montgomery County, was testing a lower Wilcox sand. H. E. Williams and John Mayo's semi-wildcat north of Lockridge, was below 5400 ft, too high for comparisons. W. P. Henry's Stoesser 1 was being rigged in Liberty County's Eastgate area by Patrick & Tyerell, to be carried to 8500 ft for Martha zone in Yegua.

Extension Tests: Stanolind Oil & Gas Co.'s Seaberg B-1, south offset to company's No. 5, Martha field, completed and shut down for storage, no gauge. Humble Oil & Refining Co. and Magnolia Petroleum Co. abandoned Baird 1, northwest Sabine Pass field, moved 6400 ft east for Baird 2, due north Sabine Pass production.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Louisiana Gulf Coast

Spud 10,000-Foot Test On Gueydan North Flank

A 10,000-ft test started on flank of Gueydan, Vermilion Parish; a Bay Marchand well, La Fourche Parish, was expected to provide gas, and the second shallow well was completed at West Lake Verret, St. Martin Parish.

Gueydan Area: Fohs Oil Co. spudded Humble 1, Sec. 27-11s-1w, north flank semi-wildcat, having opened deep production on south flank last year. Four wells produce from two pays around flanks; two Fohs wells are drilling, Pure Oil Co. and Union Sulphur Co. are drilling one each.

La Fourche Parish: Gulf Refining Co. was expected to recover gas through perforations at 1440-50 ft at Bay Marchand, having made tests up from 2900 ft.

West Lake Verret: Shell Oil Co. completed second shallow well, making 130 barrels pipe-line oil daily through 11/64-in choke from 2360-68 ft, bottomed 2369 ft.

Wildcat Progress: Cities Service Oil Co.'s Homeseekers 1, Leleaux prospect, continued fishing drill pipe, recovering down to 7100 ft. Cockburn, Hargrove & Bateman's Snowden Estate 1, Lake Latainer area, Avoyelles Parish, waited on cement before confirmation tests of Wilcox shows at 6695 ft. Oliphant Oil Corp. spudded Frost 1, northeast flank Chacahoula dome, La Fourche Parish. Barnsdall Oil Co. will drill its fourth test in Point Au Fer area, Terrebonne Parish, Sec. 25-21s-11e, drilling contract still to be awarded. Humble Oil & Refining Co.'s Marin 1, Bayou Sale prospect, drilled below 12,189 ft.

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North Louisiana

Second Well in Ajax Area Sets Casing to Test Oil Show

Outpost to Ajax one-well pool set casing to test oil show; a Sugar Creek south flank test was fishing, and a Lisbon south flank test was abandoned.

Ajax Area: Edmans Petroleum Co.'s Tanner 1, C SE SE NE 13-10n-11w, DeSoto Parish, ½ mile west of Ajax area's sole producer, ran 5½-in to test oil show at 3255 ft. Salt water sand logged just below oil, as at other tests in area. Acreage for test was assigned by J. E. Watts, who drilled discovery, pumping 33 bbls fluid daily, 72 percent salt water, 3208-13 ft.

Sugar Creek: Hassie Hunt's Dees 1, SE SE 12-19n-6w, south flank Sugar Creek, Claiborne Parish, had fishing job. Drilled to 6244 ft, hole plugged 5800 ft where oil showed in Travis Peak. Hunt secured 180 additional acres east and southeast Dees 1 since the showing.

Lisbon Field: West Drilling Co. abandoned Patton Estate 1, SE SE 7-20n-4w, south flank, 9289 ft, finding Lower Marine unproductive. H. L. Hunt took leases south of Estate 1.

North of Stacy, Concordia Parish, G. L. Parret leased 2500-acre block, Townships 7 and 8 north, Ranges 7 and 8 east; in Franklin Parish, same trend, Sinclair Prairie Oil Co. took geophysical option 12,000 acres Township 12 north, Range 3 east, with selection to be made by August, and if made to drill 3000-ft test. Sinclair Prairie has sent in gravimetric unit to check acreage. In same parish, W. A. Jones, San Antonio, assembled 12,000 acres around Sec. 11-12n-8e for 4500-ft test to start by July 1. Farther west in the trend, David Flesh assigned Big West Drilling Co. several hundred acres Township 6 north, Range 1 west.

Arkansas

Union County Wildcat Has Production Possibilities

A Union County wildcat promises oil, but hopes for Smackover lime production in Columbia County wildcat faded.

Union County: Crescent Drilling Co.'s Burns 1, NE SW 13-18-17, 3 miles east Schuler field, showed 4 stands 43.1-gr oil, 1 stand fresh water in drill-stem test 5542-46 ft through 12 perforations. Gas/oil ratio estimated 10,000/1; production from Travis Peak (Morgan). Drilled to 7607 ft with salt water in Smackover, 5½-in casing 6265 ft.

Columbia County: McAlester Fuel Co.'s Frank 1, C SE SE 16-18-21, checked Buckner 200 ft low at 8702 ft to fade hopes of Smackover production. It showed oil Lower Marine 6910-20 ft;

deepened toward Smackover goal, coring sand 8744-58 ft carrying salt water.

McKamie Field: Carter Oil Co.'s Cornelius 1, SE SE 30-17-23, Lafayette County, extended Smackover production ⅝ mile west, flowing 396 barrels 59.6-gr distillate 9280 ft, 3/8-in choke, tubing pressure 2900 pounds, gas/oil ratio 6690/1.

Wildcat Activity: Blackwell Oil & Gas Co. will drill 4500-ft test in C SE 23-5n-3w, Arkansas County, location staked 1940 by C. W. Robinson. J. W. Fitzpatrick, Jarvis Bros., Frank Hinkle and Central States Oil Co. are interested with William Fisher in 3000-ft test to be drilled on 30,000-acre block Townships 12 and 13 north, Ranges 6 and 7 west, Independence County.

Southeastern States

Alabama Test Projected To Go to 12,000 Feet

A Sharkey County wildcat continued swabbing from Selma chalk, with the outlook slightly improved. Leasing activity in other parts of Mississippi remained active, and an Alabama wildcat was projected to 12,000 ft 2000 ft below original 10,000-ft objective with new operator buying in.

Sharkey Wildcat: British - American Oil Co.'s Houston A-1, NE SW 23-11n-7w, near Cary, reported some increase in oil swabbed with salt water, brightening outlook for well at present 3306-ft depth. Casing cemented 3278 ft, plugged back and cement drilled out 3287 ft to test Selma chalk.

New Wildcats: H. Phillips et al staked Withers 1, C SW SW 17-3s-4w, Marshall County, near Tennessee line; 3500-ft test just northeast shallow dry hole. Danciger Oil & Refineries, Inc., staked tentative location for Dantzler 1, SE SW 16-2s-11w, on 565-acre assignment from Gulf Refining Co.

Lease Activity: Adams County, Reese Oliver secured 11,000 acres for 128 days for either geophysical exploration or a test, 90 days extra being given for a test; acreage in Townships 8 and 9 north, Range 2 west. Grenada County, Dr. Henry Kennedy leased 2500 acres north Grenada County Development Compayn's test Sec. 28-23n-5e, that has shown oil in recent tests. Pyramid Oil Co. has assigned Humble Oil & Refining Co. over 17,000 acres in Townships 6, 7 and 8 north, Ranges 14, 15 and 16 west, Covington County, and Humble has placed 2000 acres on record in Township 9 north, Ranges 16 and 17 west. In Forrest County extending north into Covington and Jones counties, Sun Oil Co. leased 2500 acres in Townships 5 and 6 north, Range 14 west. Tide Water Associated Oil Co. worked the area with seismograph, and is acquiring acreage. Sun Oil Co. secured 3200 acres in Township 8 north, Ranges 2 and 3 east, Jefferson County. Tide Water secured assignment 1200 acres in Townships 6 and 7 north, ranges 10 and 11 west, Jones County, south of Laurel. In the same county, Sinclair-Wyoming Oil Co. has large block and tentative location in Sec. 1-7n-10w. Carter Oil Co. was curing title on block in Townships 15 and 16 south, Ranges 6 and 7 east, Monroe County, where first Mississippi gas was discovered in 1926. Sinclair-Wyoming recently acquired wildcat block in Jones and Wayne counties, Township 7 north, Range 9 west. E. C. Johnston continued to add to a block on which he plans early test Township 10 north, Range 1 west, Yazoo County, southwest of Bentonia. R. T. Sellars leased a state tract Sec. 16-9n-2w, agreeing to start test by July 21.

Alabama: Arkansas Fuel Oil Co. took interest in Union Producing Co.'s Waite 1, C NW 27-8n-1w, Clarke County, and test is projected 2000 ft below original 10,000-ft objective.

In Covington County, F. C. Hendricks was taking scattered leases. Shell Oil Co. leased 20,000 acres Township 2 north, Range 19 east, Geneva County, where it mapped gravimetric high in 1937. F. F. Mellen was attempting to get shallow test drilled to Knox Dolomite on 5000-acre block around Sec. 8-1s-1e, Madison County. At Carey, Mobile County, Humble continued to add to holdings in Townships 2 and 3 south, Ranges 3 and 4 west.

California

Fresno County Wildcat Opens New Gas Area

Fresno County wildcat opened a new gas area, with late tests showing increasing evidence of distillate and wet gas; deep test in Los Angeles County's Oak Canyon area stopped drilling, and plugged back to try for completion; wildcats in Kern and Santa Barbara counties were abandoned, and Buena Vista Hills field test became world's third deepest.

New Gas Area: In Fresno County's Raisin City-Kerman area, Shell Oil Co. completed Properties Inc. 8-18, Sec. 18-15-18, at 5045 ft, plugging back from 6429 ft for 3.03 million ft gas from 40-ft section through ¼-in bean. Earlier test at 5175-5240 ft showed wet. Increasing evidence of distillate appeared after well produced several hours. Tops included Kreyenhagen 5986 ft, Eocene 6301 ft.

Los Angeles County: Following inconclusive test at 6910-7107 ft, Western Gulf Oil Co.'s Lechler 2, Sec. 31-5-17, deep test in Oak Canyon area, cored to 7176 ft, plugged back to 6980 ft to run casing and try for completion. With valve open 1 hour, test yielded 15 barrels 28.5-gr oil, 19 barrels salt water. Earlier test at 6485-89 ft yielded 12 barrels 22-gr oil, some water.

Dry Wildcats: Continental Oil Co. bottomed Tejon A-1, Sec. 28-11-19, Kern County's Grapevine-Wheeler Ridge area, at 6105 ft in gray sand and shale showing spotty oil at 5610-5865 ft, and prepared to abandon. Formation test showed some gas and 2160 ft gassy oil-cut mud, salt water on bottom. Texas Co. was abandoning Bishop A-3, Sec. 13-4-29, Elwood-Goleta area, Santa Barbara County, at 3239 ft after test at 3239 ft recovered little mud and water without oil.

Deep Tests: Honolulu Oil Corp.'s No. 25-P, Sec. 10-32-24, Buena Vista Hills field, became world's third deepest hole in coring fine sand and hard silty shale at 14,073 ft without oil showing. Chanslor-Canfield, Midway Oil Co. prepared to test Hobson C-9, Ventura County's Rincon field deep project, after drilling to 9337 ft. Testing 7539 ft to bottom, swabbing fluid level was at 5200 ft, showing mud, water and 30 to 40 percent oil.

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Reed City Well Gets Flow of 81 Barrels Hour From Monroe

Third well for Osceola County's Reed City pool was drilled below normal Dundee pay into Monroe, and started flowing 81 barrels an hour to provide Michigan's most encouraging strike of 1941. Previous Dundee wells pumped 30 and 80 barrels a day, respectively. Acreage is held largely by two operators, but with sufficient small tracts held independently to assure rapid drilling if a large field develops.

Another Osceola wildcat provided gas, while a Van Buren wildcat pumped 30 barrels a day natural. The state's deepest test reached the Niagaran lime, and shut down to case.

Reed City Pool: Finding saturation in Dundee at 3529 ft. indicating 40 barrels, Pure Oil Co.'s Gingrich 1, SE SE SW 30-18n-10w, third oil producer in Osceola County's Reed City pool, deepened to top Monroe at 3606 ft., with first saturation at 3636 ft; started to flow at 3643 ft and averaged 81 barrels first 5 hours, then choked to 750 barrels a day. Three derricks and 4 locations followed in 48 hours, and Weber Oil Co. prepared to deepen the field's second oil well from Dundee to Monroe. Weber, which opened Dundee oil in 1940, together with Pure, control most acreage. Gulf Refining Co. and Teater Oil Co. also are among companies starting immediate new work. The area has been drilled on 160-acre pattern to 1200-ft. Stray sand for gas.

Gas and Oil Strikes: Turner Petroleum Corp.'s Pritchard 1, NW NE NE 7-18n-7w, Osceola County wildcat, developed 3.9 million feet gas per day in Michigan Stray at 1538-49 ft. Gas was cemented off, and drilling resumed to Dundee 3600-ft objective.

Fortney Oil Co.'s Pullin 1, Section 1-1s-14w, Van Buren County wildcat northeast of Bloomingdale pool, pumped 30 barrels day natural from 1283-ft. Traverse.

State's Deepest: Reaching its first objective, Gulf Refining Co.'s Bateson 1, Section 2-14n-4e, Bay County, topped Niagaran at 8267 ft., shut down at 8271 ft. to set 7-in. casing, with cement from bottom to 3900 ft. Previously, 9-in. was cemented at 3625 ft. Cementing 7-in. may be hampered by thick salt beds, some carrying gas breaks. Niagaran will be tested for oil and gas, and if dry, test will be carried to Trenton lime, and possibly St. Peter sand. Hole was sidetracked at 6265 ft. when fishing job could not be completed after fire, and since then 17- to 19-pound mud has been carried with drilling suspended every 6 to 10 hours to bleed gas.

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Rocky Mountain Area

Hiawatha District Reports Shallow Gas Strike

Southwest Wyoming and northwest Colorado's Hiawatha district got its first shallow gas production, while a North Baxter Basin outpost neared its Tensleep objective. A drilling Lincoln County wildcat may tap a mother pool believed supplying La Barge field where oil is found at Tertiary-Cretaceous contact.

New Gas Area: Vermillion Oil Co. and Horton & Johnson's Government 1, SW NE NE 6-12n-99w, Hiawatha district, Sweetwater County, Wyoming, developed 1.5 million ft gas daily under low rock pressure in 10-ft sand at 450 feet; set 13-in casing for gas shut-off, and was deepening below 600 ft. It is 2 miles north of Vermillion's Horrocks 1, finaled for 12.0 million ft in Wasatch sand at 3540 ft with 1200-pound rock pressure.

Tensleep Test: Nearing Tensleep objective, Rocky Mountain Drilling Co.'s State 1, SW SW SW 36-20n-104w, 1¾ miles north of North Baxter Basin production, Sweetwater County, Wyoming, was drilling below 6100 ft in Phosphoria (Embar). Location near line to Salt Lake City virtually guarantees extensive drilling of 4000 acres in Baxter Basin fields if good well results.

First test to drill west of Darby fault and south of Thompson fault, on closure of Thompson fault block plateau area, K. P. M., Inc.'s State 1, NEc 36-25½n-115w, 12 miles west of LaBarge, Lincoln County, Wyoming, was drilling Phosphoria beds below 2093 feet, believed nearing first objective correlative of Embar.

Montana Deep Test: Carter Oil Co. et al's Northwestern Pacific 1, C SE SW 19-4n-62e, Baker-Glendive structure, Fallon County, attached continuous logging device 3500 ft, drilling 5975 ft red shale, projected 10,000 ft.

UNITED STATES WELL COMPLETIONS

Company, Well and Location	Init. Prod. Bbls.	Depth

Arkansas

Columbia County (Atlanta)—
Tidewater Associated, Hutcheson 2, 16-18-19n 207 8243
Lafayette County (McKamie)—
Carter, Cornelius 1, 30-17-23..... 396 9280
Nevada County (Troy)—
Benedum & Trees, Ritchie Grocer Co. 1, 11-14-20 ..... 105 2159
Union County (Urbana)—
Marine Oil Co., Union Sawmill Co. A-5, 3-18-13 ..... 75 3005

California

Fresno County (Coalinga Northeast)—
Standard, 48-19 B.....1096 8270
Kern County (Belridge)—
Belridge Oil Co., No. 45-35..... 109 8300
Kern County (Coles Levee)—
Richfield, KCL-B 85-31 ..... 269 9000
KCL-A 16-33 .....1124 9143
Kern County (Grapevine)—
Continental, Tejon A-1..... * 6105
Kern County (Greeley)—
Standard, No. 11-27 .....1175 11,510
Kern County (Kern River)—
Ray Frampton, No. 3 ..... 5 450
Kern County (Mt. Poso)—
General Pet., Heisen 5..... 47 1847
Kern County (Ten Sections)—
Shell, No. A-37-29.....2611 8235
Kings County (Pyramid Hills)—
Tide Water, West Slope 76..... * 4329
Los Angeles County (Dominguez)—
Crawford & Associates, No. 1....1500 7233
Union, Callender 79 (pb 7490).... 141 12,720
Los Angeles County (Long Beach)—
Shell, Kent-Garth 4 (pb 3834).... 27 4659
Pickler 13 ..... 66 3658
Los Angeles County (Wilmington)—
Anchor Oil Co., LACY 2..... 160 3576
Continental, LACFCD No. 14..... 240 3126
Long Beach Oil Dev. Co., No. 25. 198 4097
Petromont Oil Co., No. 1..... 150 3727
Los Angeles County (Wilmington Torrance)—
Los Angeles Basin Pet. Co., Phillips 1 .....240 3755
Orange County (Huntington Beach)—
Southwest Explor. Co., State 39.. 885 4490
Standard, Huntington A-36 (pb 4695) 52 4850
Santa Barbara County (Santa Maria Valley)—
George F. Getty, Inc., Vicente 6.. 696 4816
Ventura County (Ventura Avenue)—
Bolsa Chica Oil Co., Bolsa 7..... * 3007

*Failures; †Junked; ¶Million cu. ft. gas.

Colorado

Moffat County (East Hiawatha)—
Montana Fuel, Wilson 7, ne sw nw 23-12n-100w 290 2563

Illinois

Champaign County—
Union Prod., Messman 1, c nw ne 18-17n-11e ..... * 1850
Clay County—
Orchard Oil, Norton 6, ne se sw 7-2n-8e 130 2674
Clinton County—
Max Conrey, Jr., Mashhoff 1, ne se sw nw 18-1n-2w ..... * 1350
W. R. Holmes, Vogt 1, nw nw se 23-1n-1w ..... * 1410
Fayette County—
T. A. Booth et al, Kern 1, se ne ne 29-5n-1w ..... * 1554
Paul Dorn, Kistler 1, se sw nw 36-6n-2e 40 1614
Carter, Ashburn 2, w½ sw ne 4-7n-3e 40 1582
Miller 4, se sw se 8-7n-3e..... 27 1582
Shaw 5, ne nw ne 17-7n-3e 24 1585
Doty-Kimsey 1, nw ne se 12-8n-3e 72 1530
Knapp 1, se sw ne 20-8n-3e..... 155 1539
Wright 1, ne nw ne 21-8n-3e (pb 1608) 2 1654
Magnolia, Buzzard Bros. 8, sw sw ne 29-8n-3e 30 1417
Franklin County—
Yingling et al, Webb 1, sw se 16-5s-4e ..... * 3314
Wegener, Gentry 3, ne nw sw 24-6s-2e 300 2117
Hammond 1, n½ sw ne ne 26-6s-2e 520 2127
Adkins, CW&F Coal 2, se se sw 25-6s-2e 562 2155
Rice 5, w½ sw se nw 25-6s-2e.. 375 2162
Shell, McKemie 2, sw se ne 25-6s-2e 162 2151
Doty et al 8, se sw ne 25-6s-2e.. 189 2156
CW&F Coal Co. 1, n½ ne sw ne 36-6s-2e 600 2148
CW&F Coal Co. 3, s½ se ne nw 36-6s-2e 530 2169
Howell et al, Minier 1, n½ nw sw ne 36-6s-2e 175 2137
W. C. McBride, Minier 1, nw ne ne 36-6s-2e 468 2143
Minier 2, sw ne ne 36-6s-2e 528 2149
Morgan, Minier 4, sw nw ne 36-6s-2e 432 2161
Gallatin County—
Carter, Carnahan 1, se nw sw 4-8s-8e 76 1917
Buell & Herndon, Egyptian T&T 3, se nw se 16-8s-10e 65 2086
Phillips, Egyptian T&T 2, se se ne 16-8s-10e (pb 2072)..... 188 2073
T. A. Farrell, Goedal 1, n½ ne nw se 19-8s-10e 95 1775
Greene County—
Cambrion Oil Synd., Laninger 1, nw se ne sw 24-10n-14w..... 10 485
Ben Spencer et al, Sharpe 1, ne nw sw 29-11n-13w ..... * 760
Levy et al, Cockroft 1, sw se se 11-12n-11w ..... * 1205
Hamilton County—
DeKalb Ag. Asso., Scribner 1, s½ ne sw 27-3s-5e 520 3305
Sinclair-Wyoming, Hall 3, sw se sw 27-3s-5e 1130 3332
Friel 15-C, se se sw 34-5s-6e 300 3056
Eason, Little 1, n½ ne sw 2-4s-6e * 3461
Illinois Prod., Hood 1, ne sw nw 35-5s-6e ..... * 3172
Cameron, Griffith 1, sw sw se 31-5s-7e ..... * 3165
Kingwood, Wilson 7, nw nw se 6-6s-7e 163 2992
Jasper County—
Pure, Shinn 5, w½ ne nw 8-5n-10e 33 2836
Canny 3, e½ nw se 17-5n-10e.... 885 2820
Craig 2, w½ sw sw 20-5n-10e.. 862 2860
Utterbeck 1, n½ sw nw 29-5n-10e.1461 2858
Lawrence County—
J. S. Young, Jr., Anderson 2, w½ e½ sw sw 17-4n-10w..... * 1700
Marion County—
Hollingsworth, Mason 1, nw ne ne 19-3n-1e ..... * 1539
Absher & Booth, McMackin 8, ne sw sw 34-3n-2e 40 1950
Perry et al, Ehart 1, sw se se 12-4n-1e ..... * 1698
Obering et al, Horder 1, se se nw 28-4n-1e ..... * 1542
Schaenfelt et al, Stephens 3, se sw se 27-4n-1e 50 1360
Morgan County—
Endre et al, Hart 1, sw ne ne nw 9-16n-12w ..... * 590
St. Clair County—
Tarlton Oil, Fee 6, w½ se se se 28-1n-10w 300 730
Schachtsick, Reichert 1, nw ne sw nw 12-2s-8w ..... * 901
Wabash County—
Adams Corner Oil, Wright 1, se ne sw 9-1n-12w 75 2020
Choate, Smith 1, s½ nw ne nw 17-1n-12w ..... * 1480
Lambert, Baungart 1, ne ne se 6-1s-12w ..... * 2424

[*Continued on next page*]

Summary of Drilling Operations in the United States, Week Ended June 7, 1941

	WELLS COMPLETED								*PERMITS FOR NEW WELLS				
	Total for Week	New Wells Drilled for Oil and Gas: Oil Wells	Gas Wells	Failures	†Miscellaneous	Initial Production	Total 1941	Total this Date 1940	This Week	Total this Month	Total 1941	Total this Date 1940	Year Total 1940
Alabama	....	....	....	....	....	.....	1	.....	....	.....	....	.....	.....
Arkansas	4	4	....	....	....	783	69	85	6	6	75	62	153
California	23	20	....	3	....	10,791	484	500	....	.....	427	492	1,042
Colorado	1	1	....	....	....	290	8	3	....	.....	....	.....	.....
Illinois	93	56	....	24	13	17,593	1,394	1,615	77	77	1,835	1,906	4,532
Indiana	14	5	....	9	....	552	227	174	....	.....	....	.....	.....
Iowa	....	....	....	....	....	.....	2	.....	....	.....	....	.....	.....
Kansas	38	21	3	11	3	35,276	899	789	53	53	908	881	2,048
Kentucky	7	3	....	4	....	102	128	118	....	.....	....	.....	.....
Louisiana	17	12	....	5	....	3,908	588	712	43	43	729	727	1,658
Michigan	9	6	2	1	....	1,794	404	566	16	16	349	524	1,093
Mississippi	5	4	....	1	....	3,782	77	85	....	.....	....	.....	.....
Missouri*	....	....	....	....	....	.....	6	5	1	1	8	.....	26
Montana	8	7	....	1	....	1,485	81	70	....	.....	....	.....	.....
Nebraska*	....	....	....	....	....	.....	39	.....	2	2	36	.....	69
New Mexico	2	1	....	1	....	616	149	335	8	8	169	318	559
New York	16	11	....	....	5	121	313	460	....	.....	....	.....	.....
Ohio	43	10	12	15	6	120	697	368	....	.....	....	.....	.....
Oklahoma	47	25	3	12	7	9,603	889	970	53	53	864	871	1,888
Pennsylvania	43	28	8	1	6	32	990	1,711	....	.....	....	.....	.....
South Dakota	....	....	....	....	....	.....	....	1	....	.....	....	.....	.....
Tennessee	....	....	....	....	....	.....	....	8	....	.....	....	.....	.....
Texas	181	138	3	35	5	75,497	4,114	4,680	124	124	4,580	5,495	11,170
Utah	....	....	....	....	....	.....	....	1	....	.....	....	.....	.....
West Virginia	14	2	11	1	....	4	296	245	....	.....	....	301	782
Wyoming	5	5	....	....	....	1,278	45	66	....	.....	....	1	1
Total this week	570	359	42	124	45	163,627	11,900	13,567	383	383	9,980	11,579	25,021
Total last week	629	386	45	160	38	177,180	11,330	12,974	455	1,960	9,597	11,249	25,021
Total this year	11,900	7,523	988	2,719	607	3,528,902	....	.....	....	.....	....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Missouri date from August 10, 1940; Nebraska from August 3, 1940.
† Includes old wells deepened, water-intake, gas input, and salt water disposal wells.

United States Well Completions—*Continued*

Illinois—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Shell, Highland Comm. 5, se ne nw sw 17-1s-12w	79	2085
Chapman 1, sw sw ne 18-1s-12w	16	2114
Hall-Jordan, Bernard 1, blk 222, Mt. Carmel Tn, 20-1s-12w	*	2041
Illinois Mid-Cont. Pet., Young 1, blk 223, 20-1s-12w	224	2055
J. M. Roberts et al, Smith 1, ne se ne 20-1n-12w	30	2072
Olds et al, Riverside Park 1, nw sw sw ne 30-1s-12w	180	2010
Taylor Dr., Beny 1, w½ nw ne se 30-1s-12w	*	1944
Smoky Oil, Lovelette 1, nw ne se 9-2s-13w	*	2840
Wayne County—		
Pure, Benskin 2, nw ne 1-1n-7e	52	3100
Keith 1, w½ sw ne 36-2n-7e	*	3065
J. W. Sanders et al, Hubble 5, s½ se sw se 30-2n-8e	2400	3041
White County—		
Tide Water, Evans 6, e½ nw nw nw 4-4s-14w	70	2915
Buell & Herndon, Bond 10, sw sw se 5-4s-14w	680	2852
Yingling et al, Smith 1, ne se sw 5-4s-14w	150	2918
First Nat. Pet. Tr., Ford Hrs. 3, sw ne sw 22-4s-14w	120	2871
Superior, Ford et al 11, nw sw sw 27-4s-14w	192	2845
Fitton 9, ne sw sw 28-4s-14w	175	2885
Ford 5, sw ne se 28-4s-14w	250	2845
Greathouse 8, nw nw nw 3-5s-14w	174	2733
Sun & Ellis, Jacobs 1, sw se ne 28-4s-14w	35	2854
Jacobs 2, se sw ne 28-4s-14w	456	2854
C. D. Neff et al, Stum 1, ne nw nw 22-5s-14w	*	3105
Carter, Bolerjack 1, sw se ne 23-6s-8e	128	2583
Blackstock, Warren 1, ne sw se 4-8s-8e	*	3055

OLD WELLS DEEPENED

Clinton County—		
Algona Oil, Marshall 1, se se sw 12-1n-1w (otd 2938)	*	3137
Marion County—		
Texas, McCollum 27, nw nw ne 32-2n-2e (otd 3044)	40	4637
Freisner 21, ne ne nw 32-2n-2e (otd 3370)	85	4601
Dunning 12, se se se 2-2n-2e (otd 3397)	120	4645
Freiderich 26, ne nw sw 29-2n-2e (otd 3415)	50	4639
Lee 22, nw nw nw sw 28-2n-2e (otd 3448)	96	4660
Ladd, Young Church 4, sw sw sw nw 21-2n-2e (otd 3465)	22	4671
W. C. McBride, Lee 19, ne ne se 29-2n-2e (otd 3411)	105	4619
Magnolia, Shanafelt 41, se sw se 29-2n-2e	43	4655
Montgomery County—		
Brown et al, Luddeke 1, se nw nw 28-9n-4w (otd 1801)	*	2008
White County—		
Hiawatha, Golden 1, nw ne se 29-5s-14w (otd 2834)	7	3060

GAS INPUT WELLS

Fayette County—		
Carter, Huffman 12-2, ne ne ne nw 12-8n-3e	...	1663
Boles 21-5, nw nw nw sw 21-8n-3e	...	1596

Indiana

Blackford County—		
A. M. Jones, Crowe 1, c nw nw 25-24n-12e	*	1035
Elkhart County—		
Headley et al, Payser 1, se se se 11-38n-4e	*	634
A. W. Downs, Bement 1, nw nw sw 12-38n-4e	10	690
R. R. Tamblyn, Greens 1, sw nw nw nw 13-38n-4e	*	626
T. C. Hudson, Seaman 1, w½ ne ne nw 14-38n-4e	*	654
Gibson County—		
Papoose Oil, Cooper 18, ne se sw 13-3s-14w	160	2567
Hall Edwards, Rec., Maier 24-A, ne sw ne 14-3s-14w	150	2537
McBride et al, Blood 2, ne se ne 28-3s-14w	152	2862
Posey County—		
Carter, Stallings 1, nw ne se 35-5s-14w	*	1441
Gulf & Ellis, Blackburn 1, ne ne se 23-6s-13w	*	2904
Gulf, Roehr 1, sw sw ne 18-6s-12w	*	1166
Lelalu Oil, Inc., Dickhout 1, sw sw ne 19-6s-12w	80	2370
Sullivan County—		
Continental Oil, Schroeder 1, nw nw se 34-6n-8w	*	1314
Vigo County—		
H. N. Oakley, Montgomery 1, ne nw nw 20-14n-8w	*	1606

Kansas

Barton County—		
Shell, Harzman 2, ne se nw 33-16-11w	3000	3352
Transwestern, Fee 4, c w½ se se 12-17-11w	3000	3327
O. J. Connell et al, Peters 1, se ne se 13-20-11w	*	3343
Pem. Dr. Co., Wolf 1, c e½ ne nw 1-20-12w	*	3367
Butler County—		
Rex & Morris, Lucas 1, ne sw ne 26-28-6e	*	2845
Cowley County—		
Tulsa, Howard 1, sw se nw 12-30-5e	314	2845
Ellis County—		
Champlin, Hadley "D" 10, c s½ nw sw 17-11-17w	3000	3436
Cities Service, Collahan "C" 3, c w½ ne se 24-11-17w	3000	3395
Darby, Peavey "A" 6, c s½ nw sw 13-11-18w	3000	3346
T. M. Deal, Dreiling 4, cel ne nw sw 4-12-17w	*	3700
Graham County—		
Shields, Waggle 1, c s½ sw se 28-7-24w	*	4333
Greenwood County—		
McGinnis, Kellor 1, sec nw 22-26-13e	¶4.0	1498
Harvey County—		
Winkler-Koch, Kaufman 1, c e½ ne ne 8-22-1w	*	3618
Marion County—		
R. E. Youker, Bucher 3, nw sw ne 28-17-4e	33	2428
McPherson County—		
T. C. Johnson, Bloomquist 1, c w½ ne se 1917-1w	*	2706
Phillips County—		
Cities Service, Ray "B" 1, sw se nw 32-5-20w	2173	3597
Pratt County—		
Geo. Reeves et al, Stark 1, c w¼ sw nw 18-26-11w (pb 4154)	¶11.96	4339
Skelly, Krehbiel "A" 5, c s½ sw se 24-27-11w	339	3510
Rice County—		
Continental, Taylor 1, sw se sw 17-18-6w	*	3368
Gibson 6, se sw sw 24-18-8w	2619	3229
Aylward et al, Habiger "B" 4, c e½ nw ne 5-18-10w	102	3242
R. Olsen, Cox 3, c n½ ne se 9-20-9w	488	3253
Carlock, Oden 1, c ne 6-21-7w	*	3366
Ingling et al, Partlington 1, c nw sw 22-21-9w	¶25.94	3318
Rush County—		
Magnolia, Conrad 1, c e½ ne sw 33-19-17w	*	4018
Russell County—		
Phil-Han, Letsch 6, se nw ne 34-14-13w	1722	2860
Cities Service, Vaughn 6, cnl ne sw sw 17-14-14w	831	3309
Hartman & Blair, Gurney "A" 5, c e½ ne nw 23-14-14w	570	3050
Darby, Strecker "B" 3, c s½ sw ne 25-14-14w	270	3010
Lario et al, Waudby 3, c w½ nw ne 26-14-15w	1954	3170
Isern Bros., Mehard 1, c w½ ne se 16-15-13w	1341	3333
Derby & Crow, Maier 1, c w½ sw se 10-15-14w	502	3211
Scott County—		
Atlantic, Roark 1, c e½ ne se 10-20-33w	*	4896
Stafford County—		
Stanolind, Helmers 2, c e½ sw nw 1-22-12w	2818	3565
Kirkpatrick 2, c e½ se nw 15-24-11w	2865	3815

OLD WELLS DEEPENED

Rice County—		
H. B. Garden, Oden 8, sw se nw 5-21-7w (otd 3342)	120	3366
Russell County—		
Skelly, Opdycke 8, c s½ ne sw 29-14-13w (otd 2933)	44	2992
Phillips, Michel 2, se sw nw 36-14-14w (otd 2877)	1171	3160

Kentucky

Daviess County—		
Cumberland Pet., Ivy 10, nw sw sw ne 2-n-31	*	720
Hancock County—		
Vickers, Fischer 2, s½ ne nw sw 6-O-34	*	375
Henderson County—		
Smith, Morris 1, e½ se sw ne 4-p-26	*	1200
Sohio Prod., Willhite 1, n½ se sw sw 18-p-26	40	1507
W. E. Hupp et al, Pruitt 3, e½ w½ e½ nw¼ 23-p-26	60	1564
Ohio County—		
Dehart et al, Davis 2, s½ s½ n½ sw 7-m-32	2	630
Cumberland Pet., Richards 42, sw nw ne nw 1-n-34	*	328

North Louisiana

Caddo Parish (Pine Island)—		
Lanier et al, Spell 3, 12-20n-15w	160	1560
Davis & Hart, Muslow B-17 16-21n-15w	7	1526
Stanolind, Ardis 1, 12-21n-15w	*	2416
Weaver-Perry Oil Co., Pardue 8, 33-21n-15w	39	1581
Lincoln Parish (Lisbon)—		
Big West Dr. Co., Patton Estate 1, 7-20n-4w	*	9289

South Louisiana

Evangeline Parish (Ville Platte)—		
Continental Fontenot Tr. 3, 1	357	10,167
Ludeau-Haas Unit 8	189	10,273
Iberia Parish (Little Bayou)—		
Helis, Jr.'s Sabatier H-2	*	2958
La Fourche Parish (Golden Meadow)—		
Bateman Dr. Co., Colling 2	120	5220
Texas Co., LaTerre Co. 9	462	10,465
LL&E 18	779	10,378
La Fourche Parish (LaFourche Crossing)—		
Mikton Oil Co., Ledet 1	36	10,347
Plaquemines Parish (Grand Bay)—		
Gulf, Grand Prairie 14-A	520	8740
Plaquemines Parish (West Bay)—		
Gulf Refg. Co., Timolat B-3	405	7301
St. Charles Parish (Paradis)—		
Texas Co., Sunset Realty & Planting 2	843	10,490
Calcasieu Parish (Wildcat)—		
Hecate, Vincent 1	*	3140
Rapides Parish (Wildcat)—		
Chamblee & Pitts, Lee Lbr. Co. 1	*	4570

Michigan

Allegan County—		
Horace Barnaby, Lenartz 1 ne sw ne 2-4n-13w	8	1639
Socony-Vacuum, Weber 5, nw se nw 14-4n-13w	95	1596
Allegan Pipe & Sup., Foster 1, sw se sw 16-1n-13w	10	1460
James Flanigan, Clair 3, nw se se 29-1n-13w	30	1362
Bay County—		
Chapman Oil Co., Schultz B1, sw nw nw 2-14n-4e	51	1514
Clare County—		
Gulf, Frackelton A-1, c ne se 10-18n-5w (pb 1590)	¶14.0	4067
Osceola County—		
Taggart Bros. Co., King 1, se se se 33-17n-9w	*	1500
Kage 21, c ne 29-18n-10w	¶10.0	1155
Pure, Gingrich 1, se se sw 30-18n-10w	1600	3643

Mississippi

Yazoo County (Tinsley Dome)—		
Plains Prod. Co., Milner 3 7-10n-2w	*	5395
G. L. Reasor, Sorrells 1, 31-10n-2w	792	5090
Sylvan Prod. Co., Sorrells 1, 32-10n-2w	1680	4985
Union Prod. Co., Middleton 1, 25-10n-3w	960	4683
Roeser & Pendleton, Wise 1, 32-10n-2w	350	5335

Montana

Glacier County (Cut Bank)—		
Glacier Prod. Co., Connolly 3, se sw 6-33n-5w	152	2875
Lookhoff 4, sw se 33-33n-5w	189	2893
R. A. Kullberg, Tribal-185, 2- nw nw 19-32n-5w	198	2970
Santa Rita O&G Co., Tribal 13, ne sw 10-35n-6w	284	2938
Texas Co., Willis 2, Lot 6, 20-32n-5w	152	2780
Toole County (Kevin Sunburst)—		
Coolidge, Stone 2, se sw se 26-36n-2w	500	1621
Montana-Dakota, Dauby 317, ne nw 33-34n-1w	¶3.5	1238
M. F. Toles, Blumberg 2, nw nw ne 32-35n-3w	10	1734

New Mexico

Lea County (Arrowhead)—		
Ohio Oil, State-McDonald 22, ne nw se 13-22s-36e	616	3756
Lea County (West Eunice)—		
Wilson Oil, State 4, c ne ne 7-21s-35e	*	3897

New York

Allegany County—		
Chas. J. Reeland, Rowley farm, Bolivar	35	1232
Mary M. Scott, Scott farm, Bolivar	18	1388
Messer Oil Corp. No. 2, Miles farm, Bolivar	10	1537
Wm. Taylor Est., Reid farm, Alma	9	1349
Bradley Prod. Corp., Duke farm, Alma	6	1460
J. P. Herrick No. 2, M. Howe farm, Bolivar	11	1417
Hopkins, Short Bros. et al, Clark farm, Independence	6	1239

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Conklin & Wightman, Wetherby farm, Clarksville	5	1359
Forest Oil Co., Ackerman farm, Bolivar	8	1420
Bradley Prod. Corp., Coats farm, Wirt	8	1352
Gray Oil Co., Gray farm, Genesee	6	1410
WATER INTAKE WELLS		
Allegany County—		
Ella Murphy, Gadsby farm, Bolivar	...	1536
South Bolivar Oil Co., McKelvey farm, Bolivar	...	1371
Brothers Oil Co., Crandall farm, Bolivar	...	1289
Roy E. Vossler, McEnroe farm, Alma	...	1242
South Hill Oil Co., Harrington farm, Wellsville	...	1269

Ohio

Ashland County—		
Ohio Fuel Gas, Gantz 3	*	2895
J. H. Hoag, Metcalf 1	*	757
Athens County—		
Ohio Fuel Gas, Smith 1	¶0.45	1012
Loehler 1	¶0.03	1415
Sunday Creek Coal 194	*	485
Bern O. & G., McCune 3	¶0.05	818
Mathews Oil Co., Hayes 1	¶0.01	1477
Guernsey County—		
Wilbur Keith, Ringer 1	¶0.03	1200
Hocking County—		
Preston Oil Co., Sunday Creek Coal 192	*	3456
Jackson County—		
Fred Hurt, McKell Hrs. 1	*	3002
Knox County—		
Kundtz-Hulse, Inc., Stone 7	20	3203
H. E. Perkins, Mickley 4	¶0.75	2752
B. Johnson, Ferenbaugh 1	*	3008
Licking County—		
McCloy Bros., Hoover 2	¶0.2 & 20	2938
Ohio Fuel Gas, Nefberger 1	¶2.0	2765
Allen & Willey, Stricker 2	*	2608
Lorain County—		
Ohio Fuel Gas, White 1	¶0.17	2370
Wm. Dempsey, Bunt 4	*	183
Medina County—		
Preston Oil Co., Melton 1	5	410
M. L. Packard et al, Crocker 5	45	496
Marine Tr. Co., Packard 48-A	5	440
Packard 53-A	5	434
Packard 54-A	5	470
Monroe County—		
Huntsman & Peters, Peters 2	¶0.03	2007
A. E. Robinson, Baker 2	*	1575
Morgan County—		
Williams Bros., Choguill 1	¶0.26	950
Muskingum County—		
Industrial Gas Corp., Palmer 1	¶11.0	4149
Gas Prod. Co. of O., Finley 2	*	4205
Noble County—		
Smithberger et al, Cox 1	*	1625
Harry Cylmer, McAuby 1	*	1720
Ohio Fuel, Guiler 1	*	1726
Perry County—		
Allegheny Coal Co., Berrisford 30	*	1090
Stark County—		
Belden et al, Heldenbrand 1	¶0.7	4579
Colonial Oil Co., Forest Hill Cemetery 1	*	730
Washington County—		
Anderson et al, Benson 5	10	916
C. W. McCall, Ewers 5	3	1550
Herlan et al, Matheny 1	2	1017
GAS INPUT WELLS		
Medina County—		
Thornton Prod. Corp., Sanford & Watson 32-0	...	352
Sanford & Watson 33-0	...	360
Marine Tr. Co., Packard 52-0	...	400
Packard 56-0	...	430
Packard 55-0	...	434
Packard 69-0	...	419

Oklahoma

Caddo County—		
Phillips, Fletcher 2, ne se ne nw 34-6n-10w	1210	3392
Carter County—		
Ideal O&G, Scroggins 16, sw ne se se 32-3s-3w	3	1194
Scroggins 17, ne sec 32-3s-3w (pb 1154)	11	1160
Neustadt, Choate (20) 7, se sw nw nw 20-4s-2w	552	2037
Sun et al, Mullen "B" 35, ne ne nw sw 3-4s-3w	46	1024
Creek County—		
Wilcox, Stephney 1, ne nw sw 35-14n-7e (pb 2940)	100	4011
Burke-Greis, Peabody 1, sw se sw 20-14n-9e	*	4028
Lewis Prod. Co., Jones 2, sw ne sw 32-15n-7e	325	2836
Archer et al, King 6, se nw sw 22-17n-11e	*	2518
Hill Bros., Drumheller 2, sw ne se 28-17n-12e	*	1630
Garvin County—		
Skelly, Gibson 2, nec se 30-1n-3w	*	3745
Grady County—		
McCasland, Kearns 2, se se nw se 21-3n-5w	40	1778
Jackson County—		
Gulf, Kelly 11, nw sw ne 10-1n-20w	48	1554
Kiowa County—		
Argo, Ratliff 4, nw ne ne 19-7n-17w	572	1070
Latimer County—		
LeFlore G&E., Lyons Ro-41, nec sw 9-6n-22e	*	1882
Logan County—		
Continental, Donoghue 1, nec sw 7-17n-1w	1945	5493
McBride, Eastwood 1, ne nw sw 7-17n-1w	2256	5480
Sinclair Prairie, Sult 1, swc ne 7-17n-1w	585	5482
Okfuskee County—		
Flemming, McKinney 1-C, se nw sw se 18-10n-11e	50	2186
W. J. Smith, Johnston 1, csl se ne ne 22-10n-11e	¶4.0	2410
Reese, Berryman 4, nwc sw 36-11n-8e (pb 3503)	¶0.7	3505
Shell, Curry 5, nw se nw 35-12n-8e	87	3643
Okmulgee County—		
E. M. Jordan et al, Checotah 2-A, c s½ ne ne 35-14n-12e	15	2002
Viersen, Beidleman 5, nw nw ne sw 25-15n-13e	5	1714
Osage County—		
Dunn & Miller, Osage 2, sw ne sw ne 18-24n-8e (pb 2845)	100	2847
Pontotoc County—		
Paul Traugh, Manley 1, sw nw sw 4-5n-6e	*	2005
Pottawatomie County—		
Vise, Mitchell 1-A, ne nw ne 3-6n-4e	¶0.6	3555
Mid-Continent, Cecil 2, ne sw ne 6-6n-4e	220	4220
Hall-Jordan, Swan 1, se ne nw 29-6n-5e	*	3832
E. N. Panner, Fowler 1-A, c n½ sw ne 3-7n-4e (pb 3976)	25	4305
Commercial, McCully 4, swc se 6-7n-4e	185	3977
Seminole County—		
Rudco, Tewee 1-A, nw se sw ne 14-7n-6e (pb 3213)	37	3218
Patterson, Dempsey 1, sec sw 18-7n-8e	*	1511
Hall, Troup, Moore, Fish 2, sec nw 19-7n-8e (pb 1502)	400	1505
Wood, Homestake 3, sw sw ne sw 28-9n-6e	*	2645
Templeton 3, nw nw se sw 28-9n-6e	73	2583
Stephens County—		
McCasland, Price 1, se nw nw 12-2n-5w	*	2513
Cities Service, Cantrell 18, ne ne se se 32-1s-8w (pb 2320)	240	2739
Stanolind, Stephens 16, sw sw se nw 33-1s-8w	*	2327
Tulsa County—		
L. E. Martin et al, Crosin 5, cwl sw ne nw 8-17n-14e	*	1512
OLD WELLS DEEPENED		
Caddo County—		
English, Mays 1, se se nw sw 3-5n-9w (otd 3505)	350	4218
Carter County—		
R. Eby, Harley 4, sw nw sw nw 19-2s-3w (otd 428)	5	484
Creek County—		
Archer & Allison, House "B" 3, se nw se se 22-17n-11e (otd 2170)	*	2565
Jackson County—		
Aloma, Robertson 5, ne sw se 15-1n-20w (otd 1584)	11	1605
Seminole County—		
Sinclair Prairie, Yahola 1, swc nw 28-10n-8e (otd 4245) (pb 3600)	87	4357
WATER DISPOSAL		
Pawnee County—		
Alma, Hill 2-A, se nw sw 1-21n-5e (pb 3346)	...	3366
Reid 1, se sw nw 1-21n-5e	...	3448

Pennsylvania

BRADFORD DISTRICT

J. Wesley Coast, McCaffrey & Coast	1	....
Forest Oil Corp., 2 wells	2	....
Forest Pet. Corp.	1	....
Niagara Oil Corp.	5	....
Bradford Tr. Co., 21 wells	21	....
WATER INTAKE WELLS		
Grant & Mohan Oil Co. No. 3, Bing 486-7	...	....
Forest Oil Corp.	...	....
Forest Pet. Corp., 2 wells	...	....
Niagara Oil Corp., 2 wells	...	....
MIDDLE DISTRICT		
Gibson Wade Gas Co., Groner	¶	....
Fred Inze Lehnortt, Fee	¼	....
Kinney & Hill, Callahan	¶	....
South Penn Oil Co., Smith & Grace	1	....
SOUTHWEST DISTRICT		
Armstrong County—		
Humphrey, Stone & McCall, Slease 1	¶1.35	1592
J. K. Sharp et al, Sefton 2	¶0.18	1681
Fayette County—		
Nollem O. & G., McCann 1	*	2620
Bair 1	¶0.5	1365
Greene County—		
Charles Hart et al, Galloway 1	¶0.22	1566
Indiana County—		
T. W. Phillips, Jones 1	$0.05	3254
Washington County—		
Equitable Gas, Swagler 1	¶0.04	3137

North Texas

COMPLETIONS

Archer County (Hull-Silk Deep)—		
Chapman & McFarlin, Wilson 9-E	996	4612
Thurmond Oil Co.-R. C. Lipscomb, Wilson 12	1500	4603
Archer County (Hull-Silk)—		
King Oil Co.-Phillips Pet., Wilson 12-E	584	3867
Pet. Producers Co., Johnson 4-A	624	4321
Archer County (Wildcat)—		
D. L. Wolf et al, Young 1	*	1502
Baylor County (Wildcat)—		
British-American, Cowan 1-C	*	5522
Clay County (Antelope)—		
Shell, Henderson 11	888	3210
Clay County (Wildcat)—		
B. L. Fain et al, Campbell 1	*	1633
Clay County—		
Akin-Dimock-Costley, Taylor 2-A-E	6	280
F. H. Gohlke et al, Bunnenberg 3	*	1352
C. Y. Gorman et al, Taylor 2	36	1115
Geo. W. Graham et al, Hansard 4	10	1157
J. M. Tanner et al, Rigsby 16	3	212
Underwood Oil Co., Stephenson 1	*	1234
Cooke County (Bindel)—		
Texas Co., Fleitman 1 (new pay)	504	3246
Cooke County (Wildcat)—		
Seitz-Comegys & Seitz, Cooke 1	*	1600
Cooke County—		
C. J. Bohner et al, Sicking 7	108	1320
Jack County (Wildcat)—		
Continental, Robertson 1 (pb to 5380)	6	5577
Jack County—		
Burk Roy. Co., Enlow 6	192	3253
J. A. Worsham et al, Leach 1-A	396	2899
Montague County (Wildcat)—		
Seitz-Comegys & Seitz, Geurin-Shell 1	*	2514
Montague County—		
Claymont Oil Co., Bouldin-Crow 2	*	1202
Texas Co., Gist 11-B	9	828
Wichita County (K-M-A Ellenberger)—		
H. D. Egger et al, Preston 7-E	952	4363
Wichita County (K-M-A)—		
Hammon, Hanlon & Buchanan, Fassett-Tuttle 37	576	3987
King Oil Co., Waggoner Bros. 8	224	3857
Wichita County—		
C. W. Clark et al, Simpson 1	40	1767
White & Duncan, Waggoner Est. 11	9	1382
Geo. Proctor et al, Foster-Allen 56	10	1696
Foster-Allen 57	10	1557
Foster-Allen 58	*	1700
Staley Oil Co., Glass 4	10	1327
W. E. Prod. Co., Glass 9	52	1320
Young County—		
Paul Atchley et al, Thomas 1	*	1050
W. F. Collins et al, C. Moore 1-A	*	680
Falcon Co., Hidgon 1	157	3758
Pemeta Oil Co., Johnson 21	3	557
E. D. Willis et al, Petty 1	*	812
GAS INPUT WELLS		
Young County—		
Perkins-Cullum, Gragg 5	*	818
OIL WELL DEEPENED		
Wichita County (K-M-A Ellenberger)—		
Jack Kadane et al, Bradley (otd 4047)	*	4360

Texas Gulf Coast

Brazoria County (Manvel)—		
Texas Co., Belcher A-21	¶	5359
Brazoria County (Old Ocean)—		
Harrison & Abercrombie, Grimes BRLD 1	275	10,874
Brazoria County (W. Columbia)—		
Richardson, Holmes 2	167	8516
Chambers County (Barbers Hill)—		
Texas Gulf Prod. Co., Fitzgerald (Davis) 2	463	5612
Harris County (Dyersdale)—		
Jack Frazier, Alcorn 1	180	4068
Dwyer 2	273	4153
Harris County (Pierce Junction)—		
Rio Bravo, Settegast A-37	544	4290
Harris County (Tomball)—		
Humble's Schultz A-5	187	5573
Jefferson County—		
Humble & Magnolia Baird 1	*	8015
Liberty County (Hull)—		
Campbell Dr. & Prod. Co., Palmer 2	486	2302
South Oil Co., Merchant C-1	518	6147
Taylor 2	155	2900
Orange County (Orange)—		
D. M. Wallace, First Nat. Bk. 1	149	5630
Wharton County (Pickett Ridge)—		
Texas Co., Nilson 6	75	4705
Wharton County (Withers)—		
Texas Co., Pierce C-95	97	5286

United States Well Completions—*Continued*

East Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Joiner Area—		
P. G. Lake, Inc., Lee 8-A (43-58-ac)	1200	3746
McMurrey Corp. et al, Pinkton 5	1500	3667
Oklahoma-Texas Trust Co., Neal 9	3000	3764
Kilgore Area—		
Kirby Pet. Co., Reddic 9	960	3732
Magnolia, Griffin 25 (44½-ac)	750	3610
Tide Water Associated, Laird 4	1000	3651
J. J. Jenkins et al, Utzman 4	750	3544
Utzman 5	750	3560
Longview Area—		
B. P. Dunlap et al, Rogers-Dunlap 2	2000	3671
Rogers-Dunlap 3	2500	3700
Magnolia, Parnell 8 (40-ac)	3000	3568
Franklin County (Talco)—		
Byrd & Frost, Phillips 14	240	4280
Humble, Penn-Humble 24	341	4294
Gregg County (Willow Springs)—		
Humble & Gulf, Fisher 1	*	7705
Houston County (Grapeland)—		
Grapeland Oil Co., Mobley 1	¶115.0	6015
Navarro County (Richland)—		
C. L. Brown et al, Swink 1	5	2954
Titus County (Talco)—		
Humble, McPeters 8	*	4368
Wood County (Hawkins)—		
Roy L. Fisher et al, Beck 1	457	4782
Humble, E. M. Faulk 1-B (160.29-ac)	357	4850
Mayfield Co. 1 (35.35-ac)	370	4854
E. Prince 1 (96.81-ac)	173	4828
T. C. Snow 2 118.86-ac)	400	4873
B. C. Wyatt 1 (146-ac)	152	4896
Roger Lacy et al, Pennal 1	432	4746
H. D. McDonald & Smith (was H. W. Bell), Thorn 1 (5/10-ac)	437	4802

Southwest Texas

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Brooks County (Kelsey)—		
Magnolia, State-Marshall 7	¶8.4	4758
Hidalgo County (Wildcat)—		
Mina, Krauss First Nat. Bank 1	*	1006
Jackson County (La Ward)—		
Humble, Bonnet 2	950	5227
Jackson County (Lolita)—		
Cox & Hamon, McCall 1	500	6420
Luling O&G, Johnson 3	550	5942
Magnolia, Mitchell 22	650	5290
Skelly, Mitchell 2	600	5944
Jackson County (West Ranch)—		
Magnolia, West 152-A	550	5599
West 156-A	700	5555
West 158-A	550	5577
Phillips Pet., Toney 6	400	5810
Karnes County (Wildcat)—		
R. E. Fair, Hancock 1	500	2055
Jim Wells County (West Alfred)—		
Lewis Prod. Co., Adams 2-A	650	3354
Jim Wells County (Ben Bolt)—		
Rowan & Hope, Kynette 1	*	5510
Jim Wells County (Bentonville-King)—		
Damascus Corp., Pope 3	300	5701
Jim Wells County (La Gloria)—		
La Gloria Operators, La Gloria Unit 11	¶200.0 & 300	6800
Jim Wells County (Wade City)—		
R. E. Wolfe, Welhausen 1	100	4926
Nueces County (Bentonville-King)—		
Suthern Minerals, King 21-B	500	5657
Nueces County (S. Clara Driscoll)—		
Magnolia, Johnson 9-A	†	840
Nueces County (Minnie Bock)—		
Windsor Oil Co., Parr et al 1, new sand	300	3915
Nueces County (Wildcat)—		
E. A. Graham & R. S. Waldron, Singer 1	*	7020
Refugio County (Refugio)—		
CE-Beth Oil Co., Shelton et al 1-C	¶15.0 & 75	6910
Hewitt & Dougherty, Reilly et al 1	500	6775
San Patricio County (Odem)—		
Wellington Oil of Del., Welder 1-C, new sand	¶0.20 & 50	7213
Victoria County (Placedo)—		
H. B. Ownby Co., South Texas Cotton Oil 1	350	4771

LAREDO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Duval County (Casa Blanca)—		
Magnolia, D.C.R.C. 3 (88)	*	2346
Duval County (Charamousca)—		
N. V. Duncan, Worden & Drought 1-A	22	1554
Duval County (Cole)—		
G. Griffin, King-Harper Est 2	*	1769
Duval County (Colmena)—		
Colmena Oil Co., D.C.R.C. 1-A	*	1988
Jim Hogg County (Colorado)—		
C. Andrade II, Martinez 2-H	350	2910
Humble, King-Colorado 18-B	500	2937
McMullen County (Rhode)—		
Argo Oil, Edrington 3-A	*	loc
Rhode 1-B	*	2700
Starr County (Boyle)—		
Fidelity Oil & Roy. Co., Carruth et al 8-D	*	4130
Starr County (North Rincon)—		
Sun, Coates 3	23	5702
Starr County (Rincon)—		
Continental, Slick Est. 36-A	17	4376
Slick Est. 38-A	375	4202
Slick Est. 83-A	*	4258
Slick Est. 48-B	650	4250
Starr County (Samfordyce)—		
Phillips, Elizondo 3	250	3512
Starr County (Sun)—		
Humble, Montalvo 5	350	4886
Webb County (Volpe)—		
F. R. Williams, Benavides 1	*	2772
Webb County (Wildcat)—		
H. Muckelroy & H. E. Hall, Slator 1	*	1810
Zapata County (Wildcat)—		
J. W. Kunetka, Trevino 1	*	1510

OLD WELLS DEEPENED

Company, Well and Location	Init. Prod. Bbls.	Depth
Zapata County (Lopeno)—		
Venture Pet. Corp., Vela et al 1 (otd 2225)	¶20.0	2550
W. H. Winn, Vela 2 (otd 2408)	¶20.0	2567

SAN ANTONIO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Bastrop County (W. Cedar Creek)—		
Hubert Dickey, Litton 5	*	1650
Litton 4	*	1954
Bexar County (Gas Ridge)—		
Southwest Dr. Co., Covell et al 17	2	430
Caldwell County (Wildcat)—		
Wiegand Bros., Epstein et al 1	*	3035

Texas Panhandle

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Skelly Oil, Schafer 121	426	3130
Gray County—		
Cities Service, Crow 9	106	3230
W. H. Taylor Oil Co., Taylor 2-B	268	2934
Hutchinson County—		
Cree-Hoover & Dye, Harvey Sisters 9	143	3059
Holmes et al, Quinn 10	388	3100
Kewanee Oil Co., Lewis 55	311	3019
Phillips Pet., Cockrell 60	190	3090
Cockrell 62	184	2905
Wheeler County—		
Homer Ewton et al, Morgan 1	77	2180

West Central Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Callahan County—		
Clark & Young, Diller Bros. 1	10	441
Coleman County—		
States Oil Corp., Coker 5	86	3606
Jones County—		
Thos. D. Humphrey et al, Rust 1	154	2484
W. B. Omohundro et al, Gunn-Adams 8	151	1893
Shackelford County—		
L. A. Foster et al, Anderson 2	*	650

West Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Cochran County (Slaughter)—		
Atlantic Ref. Co., Boyd-Humble 9	708	5061
Cascade Pet. Co., Igoe-Smith 1	789	4979
Devonian Oil Co. et al, Boyd 3	1007	5058
Crane County (South Sand Hills)—		
Gulf, Waddell et al 23	2037	5652
Crockett County (World-Powell)—		
Garrett M. Cmith et al, Powell-Sinco 1-C	260	2685
Ector County (Wildcat)—		
Cities Service, Addis 1	*	5500
Ector County (Foster)—		
Cities Service, Bagley 8-A	488	4265
M. J. Delaney & Murchison, Johnson 1-A	1048	4165
Forest Dev. Corp., Moss 2-G	288	4339
Ector County (Goldsmith)—		
Gulf, Goldsmith 354	1166	4238
Goldsmith 355	1749	4245
Ector County (North Cowden)—		
Stanolind & M. J. Delaney, Smith 11	418	4392
Texas Co., Holt 7	355	4529
T. P. Coal & Oil Co., Holt 1	713	4520
Tide Water, T. P. Land Tr. 4-A	996	4170
Gaines County (Seminole)—		
Amerada, Matthews 5-A	725	5350
Magnolia & Atlantic, H&J 14-195	302	5270
H&J 9-217	433	5318
Ohio Oil, Averitt 4	734	5260
Gaines County (Wasson)—		
Amon G. Carter, Moore 6-A-46	591	5000
Continental & Amon Carter, Moore 7-46	431	5041
Hockley County (Slaughter)—		
Magnolia, Wilson 2	*	5596
Mid-Continent Pet. Corp., Mallett 3-B	757	5027
Sid W. Richardson et al, Coe 6	1112	4975
Slaughter 13	726	4984
Slaughter 15	770	4980
Slaughter 1-C	1441	4995
Stanolind, Givan 1	2346	5026
Howard County—		
Pure, Chalk 18	507	3134
Pecos County (Taylor-Link)—		
Landreth Prod. Corp., University 5-K	990	1740
Pecos County (Tobarg)—		
Cardinal Oil Co., Tippett 64-E	9	379
Stonewall County (Carlisle)—		
Leader Oil Co., Carlisle 3	*	6576
Ward County—		
Gulf, O'Brien 173	916	2777
Yoakum County (Wasson)—		
Aloco Oil Co., Miller-Texaco 15-B	1004	5218
Moore-Texaco 5	368	5243
Amon G. Carter & Conoco, Willard 10-38	1148	5050
Dr. & Explo. Co., Hudson-Shell 2-B	602	5100
Humble, Stanford 2	273	5210

OLD WELL DEEPENED

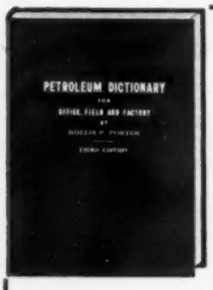
Company, Well and Location	Init. Prod. Bbls.	Depth
Gaines County (Wasson)—		
Continental, Moore 2-45 (otd 4980)	944	5054

West Virginia

Company, Well and Location	Init. Prod. Bbls.	Depth
Boone County—		
Owens, Libby-Owens, Allen & Pryor 31	¶0.08	1918
Calhoun County—		
South Penn, Sharps 6	2	2244
Brannon 6	¶0.08	2262
Hancock County—		
R. J. Braden Co., Brenneman 62	2	868
Kanawha County—		
Spartan Gas, Clendenin 2	¶3.8	5000
Columbian Carbon, Jones 1	¶2.28	4926
Godfrey L. Cabot, Bailey 1	¶2.0	1697
Lincoln County—		
Rich Fork O. & G., Croft 10	¶0.38	4022
Russell Gas, Stump 3	¶0.09	3652
Ritchie County—		
Geo. J. Ballentine, Tibbs 2	¶0.23	1901
Roane County—		
Boggess Dr. Co., Raines 2	*	1881
Wayne County—		
Priddy O. & G. Co., Adkins 1	¶0.16	2860
Owens, Libby-Owens, Koonce & Zimmerman 2	¶0.17	2879
So. W. Va. O. & G., Preston 4	¶0.06	2856

Wyoming

Company, Well and Location	Init. Prod. Bbls.	Depth
Fremont County (Maverick Springs)—		
Valentine Kirk, Tribal 2, nw ne se 22-6n-2w	345	1204
Niobrara County (Lance Creek)—		
Argo Oil Corp. Ford 10, se se nw 33-36n-65w	23	5295
Continental, Schuricht 8-A, nw ne se 6-35n-65w	360	5270
Ohio, Carrie Putnam 20, nw sw 33-36n-65w	400	5436
Park County (Oregon Basin)—		
Enalpac O&G Co., Pauline OPC-1, 3, se se 5-51n-100w	150	3816



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WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORTS

Kern County—Union Oil Co.'s Morgan 81, sec 14-32-26, lcn, Paloma area.

King's County—Pyramid Prod. Co.'s Spreckles 2, sec 16-24-18, rig, Pyramid Hills area.

Sacramento County—Jergins Oil Co.'s Twitchell 1, sec 8-3-3, lcn, Rio Vista area.

COMPLETIONS

Kern County—Continental's Tejon A-1, sec 28-11-19, td 6105 ft in shale and gray sand with spots of oil, formation test showed gassy mud and sw with fair blow of gas 5937-6105 ft, top Fruitvale shale 5740 ft, abnd, Grapevine area.

Kings County—Tide Water's West Slope 76, sec 20-24-18, td 4329 ft in silty shale, top Kreyenhagen 1200 ft, Cretaceous 2375 ft, abnd Pyramid Hills area.

KANSAS
FIRST REPORTS

Barton County—Armer et al's Redetzke 1, c s½ sw nw 5-16-11w, dr. R. H. Shields et al's Kimpler 1-A, c w½ nw ne 31-18-11w, dr.

Cowley County—Magnolia et al's Banta 1, c s½ se ne 26-30-5e, dr. Steinbuchel et al's Peck 1, c n½ nw se 23-34-5e, dr.

Phillips County—H. L. Wirick et al's Friebus 1, c w½ sw nw 36-2-19w, dr. Lario et al's Lynch 1, c s½ se sw 24-4-20w, dr.

Rice County—Hartman et al's Brothers 1 c n½ nw ne 17-21-6w, dr.

Russell County—Cities Service et al's Stoppel 1, nw ne sw 17-14-11w, dr.

Stafford County—Stanolind's Ahnert 1, c e½ ne se 26-22-13w, dr.

COMPLETIONS

Graham County—Palm King Oil Co. et al's Steinmetz 1, sec ne 6-7-21w, anhydrite 1855 ft, Herner 3430 ft, Lansing 3482 ft, Arbuckle 3778 ft, abnd 3856 ft.

Pratt County—Aladdin Pet. Corp.'s Reschke 1, c w½ sw sw 18-27-13w, anhydrite 860 ft, Topeka 3230 ft, Lansing 3909 ft, base Kansas City 4223 ft, Mississippi 4335 ft, cherty Viola 4383 ft, Simpson 4496 ft, Arbuckle 4572 ft, abnd 4600 ft.

Sedgwick County—C. L. Carlock et al's Whitson 1, c w½ nw sw 25-25-2e, Lansing 2130 ft, Kansas City 2392 ft, Mississippi 2848-3139 ft, Misener 3204 ft, Hunton 3208 ft, Sylvan 3230 ft, Viola 3237 ft, Simpson dolomite 3261 ft, Simpson 3293 ft, Arbuckle 3347 ft, abnd 3367 ft.

SOUTH LOUISIANA
FIRST REPORTS

Allen Parish—F. K. Campbell, Jr.'s Bowles 1, Oakdale area, 14-3s-6w, lcn.

St. Landry Parish—J. A. Hafner, Jr.'s Hidalgo 1, SW Opelousas area, nw sw 26-6s-3e, loc.

COMPLETIONS

Calcasieu Parish—Hecate, Inc.'s Vincent 1, Rose Bluff area, nw ne 26-10s-10w, abnd 3140 ft.

Rapides Parish—Chamblee & Pitts' Lee Lbr. Co. 1, South Catahoula Lake area, se sw 6-5n-3e, abnd 4570 ft.

MICHIGAN
FIRST REPORTS

Mecosta County—W. E. Ross' Oliver 1, c s sw 14-15n-8w, dr.

Newaygo County—Taggart Bros. Co. Auble 1, nw nw nw 10-16n-11w, dr.

Osceola County—C. L. Maguire, Inc.'s Watson 1, c e½ sw nw 1-17n-9w, dk.

COMPLETIONS

Osceola County—Taggart Bros. Co.'s King 1, se se se 33-17n-9w, abnd 1500 ft.

MISSISSIPPI
FIRST REPORT

Marshall County—H. Phillips et al's Withers 1, c sw sw 17-3s-4w, mat.

OKLAHOMA
FIRST REPORTS

Caddo County—Roy Starr O. & G. Co.'s Crouse 1, ne se ne 7-6n-13w, dr.

Creek County—J. C. Williams, Brown 1, ne nw nw 16-17n-10e, dr.

Osage County—Devonian's Osage 1-A, swc ne 34-22n-7e, lcn.

Pawnee County—Hurwell et al's Isaacs 1, nw sw se 25-20n-6e, dr.

Pottawatomie County—Manahan Oil Co. et al's Brown 1, sec 21-10n-3e, dr.

Wagoner County—C. K. Minter et al's McGinnis 1, ne se ne 30-18n-17e, dr.

COMPLETIONS

Hughes County—Arrow Dr. Co. et al's Grannerman 1, sw nw se 23-9n-11e, 7 mi e Wetumka, discovery, Booch 2250 ft, Gilcrease 2662 ft, Cromwell 3395 ft, td 3445 ft, pb 2336 ft, perf. 12 shots 2260-73 ft, shot 60 qts 2244-74 ft, 3,000,000 ft gas.

NORTH TEXAS
FIRST REPORTS

Archer County—Bridwell Oil Co.'s Bridwell 2-D, ne nw TE&L sec 1853, lcn. D. L. Wolf et al's Young 2, sw ne TE&L sec 2486, lcn.

Cooke County—Dickson Oil Co. & R. B. George's George 1, north corner 40-ac lse, Jas. Bradshaw sur A-29, Sivells Band prospect, lcn 6000-ft test.

Jack County—Adam Grafe et al's Bloodworth 1, 5012 ft from sw and 5228 ft from m/nw/nw line of Wm. McDonald sur A-380, lcn 3500-ft test.

Young County—N. H. Martin & Son's Hunt 1, se ne ne TE&L sec 175, lcn. D. B. Holland et al's Lisle 1, nec of south 187.8-ac of TE&L sec 112, lcn. Geo. Keith, Jr., et al's Daily 1, 1233 ft from w and 817 ft from s lines J. R. Cooke sur A-1405, lcn.

COMPLETIONS

Archer County—D. L. Wolf et al's Young 1, e½ TE&L sec 2486, Gunsight 1454-61 ft, abnd 1502 ft.

Baylor County—British-American's C. Cowan 1-C, swc T&NO sec 75, A-542, top Bend 5206 ft, Mississippian 5470 ft, abnd 5522 ft.

Clay County—B. L. Fain et al's Campbell 1, nw part blk 140, Byers subdiv, abnd 1633 ft.

Cooke County—Texas' Fleitman 1, 1580 ft from n and 330 ft from e lines W. M. Simpson sur, A-966, new pay for Bindel pool, top Ellenberger 3241 ft, dolomite pay 3142-46 ft, flowed 105 bbls natural, 5 hrs ½-in choke.

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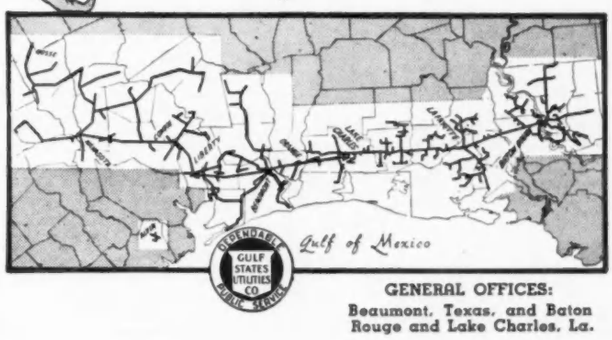

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Seitz-Comegys & Seitz's Cooke 1, 2610 ft from n 150 ft from w lines S. W. McKneely sur, abnd 1600 ft.

Jack County—Continental's Robertson 1, 1050 ft from s and 990 ft from w lines M. J. Swan sur, new pool opened Dec., 1940, and completion deferred, pb from Ellenberger water 5577 ft to 5380 ft acid and shot Mississippian 5307-80 ft, flows 6 to 10 bbls oil and equal amount water daily.

Montague County—Seitz-Comegys & Seitz's Geurin-Shell 1, nec 75-ac tr, MEP&P sec 53, abnd 2514 ft.

SOUTHWEST TEXAS

FIRST REPORTS

Bastrop County—Banks L. Miller, Tr.'s Williams 1, Charles C. Smith sur, 2 mi ne Hilbig fld, dk 2500-ft Serpentine test.

Bee County—W. C. McBride, Inc.'s Shumbera 1, Bee County School Lands sur 16, 5 mi w Skidmore, lcn 4750-ft test.

Bexar County—Jack A. Tarver et al's Uechel 1, Burchard sur, 15 mi se San Antonio, lcn 1800-ft test.

Brooks County—Sun's Cage 1, sur 141, sw Falfurrias, lcn 9000-ft test.

Duval County—Magnolia's DCRC 1 (306) GC&SF sur 306, 7 mi w Freer, lcn 3000-ft test.

Jackson County—W. V. Bowles & Co.'s Niebuhr et al 1, Morris & Cummings sur, 4, 2600 ft w Ganado fld, ru 7000-ft test. R. A. Irwin and Leslie A. Johnson et al's Vesely 1, John Davis sur, ab 16, 3 mi e Ganado, mi 7000-ft test.

Jim Wells County—La Gloria Operators Committee's La Gloria Unit 14, blk 9, 3420 ft s No 5, dk 6800-ft test. W. R. Quin's Brand 1, George Reynolds sur, sw outpost to Wade City fld, lcn. Sun's Canales 1, A. Canales sur 182, 5100 ft w of s outpost to E. Premont fld, lcn 6900-ft test. Transwestern Oil Co.'s Dunlap 2, S. K. and K. sur 179, s of E Premont area, lcn 6700-ft test.

Live Oak County—Brewer-Hixon Oil Co.'s Sugg 1, lot 5, Neuhaus and Kessler sub, 6 mi se Lucas fld, lcn 4750-ft Jackson test.

Nueces County—Sam E. Wilson, Jr. and Gulf Plains Corp.'s Union Central Life Ins. 1, Charles Paso Ancho de Abajo gr, sec a, lcn.

Starr County—Snowden & McSweeney Co. et al's Osborn 1, Share 1, Los Retachez gr, 1 mi nw Sun area, lcn 6000-ft test.

Webb County—Magnolia's Lopez 1, sec 728, A. B. & M. sur, 11 mi ne Oilton, lcn 3000-ft test. W. C. McBride, Inc.'s Prudencia B. de la Garza 1, sur 679, 8 mi n Bruni, lcn 2500-ft test.

Williamson County—H. G. Dickinson's Pope 1, Fred Tegge sur, 3½ mi sw Granger, dr 720 ft.

COMPLETIONS

Caldwell County—Wiegand Bros. Epstein 1, Tinney lg, 2 mi ne Tenney Creek, Edwards 3018 ft, abnd 3035 ft.

Duval County—Colmena Oil Co.'s DCRC 1-A, sec 52, 2800 ft w Colmena area, abnd 1988 ft.

Hidalgo County—Mina Krauss' First Nat. Bank 1, blk 34, porc 46, 4 mi ne Samfordyce fld, temp abnd 1006 ft.

Jim Wells County—Rowan & Hope, Inc.'s Kynette 1, sh 4, 1½ mi se Ben Bolt area, abnd 5510 ft.

Nueces County—Graham & Waldron's Singer 1, Villareal gr, 2½ mi sw Corpus Christi, abnd 7020 ft. Windsor Oil Co.'s Parr 1, sec 37, Pauls subd, Minnie Bock fld, td 3915 ft, 41 bbls, 7/64-in ch, tp 950 lbs, cp 1150 lbs, 24.5-gr, no water, gor 1400/1, 5½-in 3742 ft, sand 3698 ft, new sand.

San Patricio County—Wellington Oil Co.'s Welder 1, Hart & Sons sur, 1 mi sw Odem fld, td 7213 ft, gas and dist, 2800 lbs working pres, 5½-in csg 6750 ft, perf 6710-20 ft, new sand extension.

Webb County—Muckelroy & Hall's Slator 1, sec 93, 10 mi s Aguilares, abnd 1810 ft. Frank Williams' Benavides 1, sur 692, ½-mi sw Volpe fld, abnd 2772 ft.

Zapata County—J. W. Kunetka's Trevino 1, El Grullo gr, 15 mi sw Randado, abnd 1510 ft.

WEST TEXAS

FIRST REPORTS

Brewster County—Chester Dewey et al's DeCles 1, c nw sw GC&SF sec 45, blk 4, lcn 3000-ft test.

Pecos County—Walter C. Chemin & Jack L. Brown's Bowen-Humble 1, H&GN sec 60, blk 10, mim 1500-ft test.

Ward County—Stanolind's Spencer-Evans 1, H&TC sec 53, blk 34, sp and rur.

COMPLETION

Ector County—Cities Service's Addis 1, near c sw se T&P sec 34, blk 43, T-2-S, elev 2970 ft, anhydrite 1590 ft, Yates frost 2710 ft, San Andres lime 3670 ft, abnd in Clear Fork or Holt zone, 5500 ft.

EAST TEXAS

FIRST REPORTS

Henderson County—C. S. Amos & E. E. Perry's Smith 1, near c of c 40 ac of 127-ac tr, M. T. Equis sur, 6 mi ne Poyner, lcn.

Smith County—M. H. McMurrey et al's Becker 1, nwc 26.7-ac tr & M. Culberson sur, 1 mi w Mount Sylvan, Trinity test, dr 3450 ft.

Wood County—Ed. V. Parsons et al's Bellamy 1, 226-ac tr, F. L. Smith sur, 4 mi se Winnsboro.

WEST CENTRAL TEXAS

FIRST REPORTS

Coleman County—R. D. Herring et al's Hughes 1, nwc sw HT&B sec 28, sp.

Eastland County—Bryan & Stewart's Hall 1, nec se H&TC sec 46, blk 2, lcn.

TEXAS GULF COAST

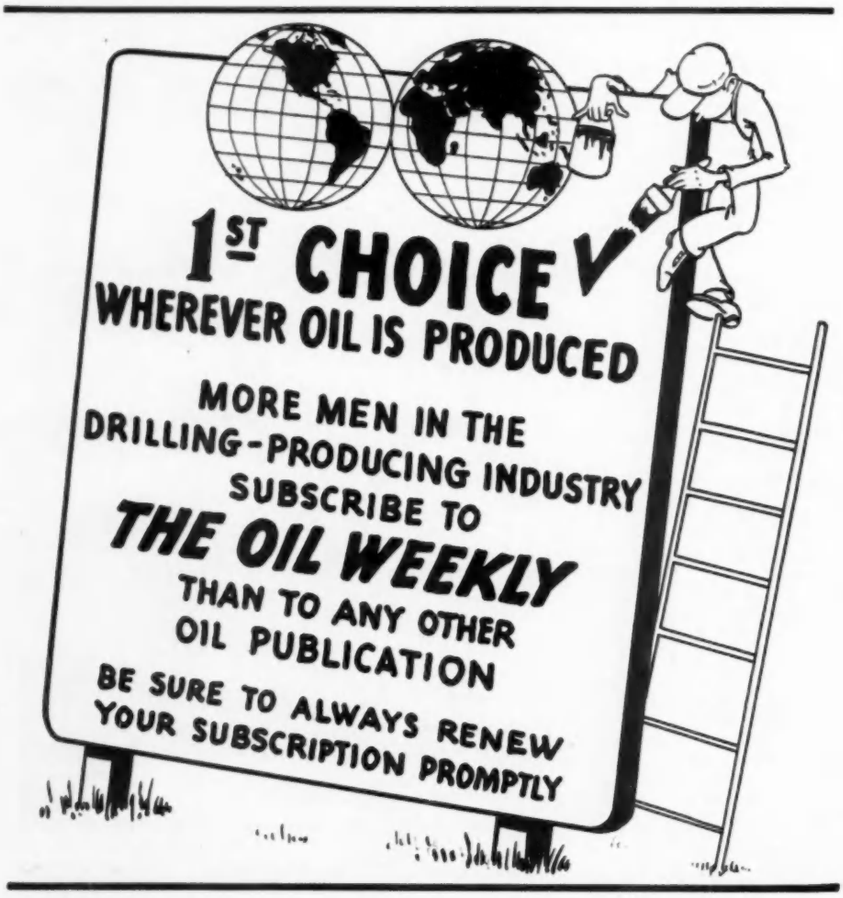
FIRST REPORTS

Harris County—Harrold Taylor's Swilley 1, (new designation) this location formerly carried as Tilson Construction Company in Victor Blanco Survey.

Liberty County—Winston P. Henry's Stoesser 1, s part H&TC Survey 115, near Eastgate, proposed depth 8500 ft, rig.

COMPLETION

Jefferson County—Humble & Magnolia's Baird 1, nw Sabine Pass field, Benj. F. Howard sur, abnd 8015 ft.



War Brings Sharp Drop In Iraq Production

A marked drop in Iraq production has resulted from two months of warfare in that country. Crude production from January through April amounted to 3,900,000 barrels, as compared with 10,300,000 barrels in the same period of 1940. Fighting between the British and Iraqis began early in April, and has since spread with the entry of German forces upon the scene, principally in the region around the Mosul oil fields.

Crude production in April was less than 1,000,000 barrels. Several months ago, oil from Mosul ceased flowing through that branch of the pipe line which runs to Tripoli in French-controlled Syria, now in German hands. Recent press reports which could not be confirmed in New York assert the branch of the pipe line running to Haifa has been cut at several points by hostile Iraq forces, which the British so far have not overcome.

MEN IN THE INDUSTRY'S NEWS

WILLIAM L. DUCKER, former chief engineer for Bovaird Supply Company and C. H. Frost, president of Gravimetric Survey Corporation, have organized Product Engineering Company with headquarters at 409 Orpheum Building, Tulsa. An engineering graduate of Oklahoma University, he was Seminole district engineer for Barnsdall Oil Company in 1928-29, and later was mechanical engineer for the company in Tulsa. In 1931, he was design engineer for Petroleum Chemical Corporation. From 1934-37 he was chief engineer for Engineering Laboratories, Inc., and in 1937-41 chief engineer for Bovaird Supply Company. Frost, who has been engaged in geophysical work for the past twelve years, continues as president of Gravimetric Survey Corporation. E. O. Patterson, University of Texas graduate engineer, is field engineer.

W. L. Ducker

JESSE J. RICKS, president of Union Carbide and Carbon Corporation, has been named board chairman, and is succeeded as president by James A. Rafferty, former vice president. Robert W. White, secretary-treasurer, has been named a vice president.

E. E. MOORE has been transferred by Arrow Drilling Company from Tulsa to Fort Worth, where he replaces James Parker, who has been called to Army service at Fort Sam Houston, San Antonio. Moore will represent the company in West Texas and New Mexico.

PETRUS W. MEYERINGH has been named a vice president and member of the executive committee of Hercules Powder Company, Wilmington, Delaware. Albert E. Forster, general manager of the company's naval stores department, and Luke H. Sperry, chief engineer were named to the directorate.

H. F. SINCLAIR has been elected president of Consolidated Corporation, New York. Other Officers named by a newly elected board of directors are E. W. Sinclair, chairman of the executive committee; Sheldon Clark, chairman of the finance committee; P. W. Thirtle, comptroller; M. L. Gosney, vice president and treasurer, and O. M. Gerstung, secretary. C. T. Stanford was appointed general counsel.

GEORGE T. KILMON has been elected assistant secretary, and Edward M. Martin, assistant treasurer of The B. F. Goodrich Company, Akron, Ohio. Kilmon, member of the company's legal staff for 16 years, will fill a vacancy caused by the death of J. L. McKnight, and will be in charge of the company's law department. He joined the company in July, 1925, following graduation from the University of Virginia. Martin, who returned to the United States from France on April 15, joined the company in February, 1920, as a member of the Akron credit department, later going to Toledo, Atlanta and New York City in managerial capacities for this department. In 1931, he was assigned to duties in Europe, Africa and the Near East, remaining abroad, except for short business trips to the United States, until his return last month. He is a graduate of Harvard University.

WILLIAM A. MARSTELLER has been appointed advertising and sales promotion manager for The Edward Valve & Manufacturing Company, East Chicago, Indiana.

FRANCIS J. LE BLANC, sales engineer for Sperry-Sun Well Surveying Company formerly located at Lubbock, Texas, has been called for active duty in the Army. A second lieutenant in the Engineering Corps, he is stationed at the University of Louisiana, where he is an instructor.

L. J. LYNCH has been named Detroit district representative for Morris Machine Works, Baldwinsville, New York. He will make his headquarters at 403 Kales Building.

G. R. KING has been named president of the petroleum engineering club of A. & M. College of Texas for the 1941-42 school term. Other officers are Louis Tomaso, vice president; Gene Caperton, secretary, and Bill Doran, treasurer.

LEE KINNEBREW, 61, oil operator and drilling contractor of Shreveport, Louisiana, died in a Shreveport hospital last week after a brief illness. He was a native of Corsicana, Texas. Interment was in Shreveport.

J. J. PERKINS, Wichita Falls operator and associate of L. H. Cullum, has donated $150,000 to Southern Methodist University, Dallas, for the erection of a gymnasium. Perkins is a trustee of the institution, and in past years has materially aided in the financing of permanent buildings.

JOSEPH MERKT, West Central Texas production superintendent for The Texas Company, was given a motor boat by employes May 31 at a picnic held near the company's discovery well of the Breckenridge district. He has been with the company more than 30 years, and is to retire late this year.

T. S. CHAPMAN, Humble Oil & Refining Company, will speak on "The Control of the Filtration Characteristics of Drilling Muds" before the Gulf Coast Section of the American Institute of Mechanical & Metallurgical Engineers, to be held June 10 at River Oaks Country Club, Houston. M. L. Cashion, Gulf Oil Corporation, will show a color motion picture of a blowout and fire and its control at West Bay.

E. E. MOORE, petroleum engineer for Arrow Drilling Company, Tulsa, has been assigned to duty in the company's Fort Worth office, replacing Major James Parker, who has been called by the Army.

RALPH C. GWILLIAM, formerly with Ohio Oil Company, Tulsa, has joined Helmerich & Payne, Inc., as manager of the latter's new district office at Fort Worth.

J. M. HOWELL, executive assistant to E. D. Spicer, manager of the Schenectady works of General Electric Company, has been named to succeed his chief, who

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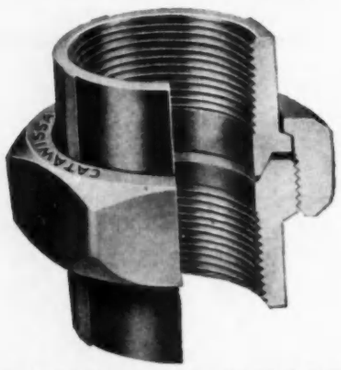

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MEN IN THE INDUSTRY'S NEWS

has been advanced to the post of assistant to the vice president in charge of manufacturing. Howell started with General Electric nearly 40 years ago, when he was engaged as a shop clerk in the old switchboard department. In 1905, he transferred to the cost department. He was appointed assistant section head of the department in August, 1906, and head of turbine costs in December of the same year. In February, 1909, he was named head of turbine and control cost department, and was appointed chief cost accountant for the works in July, 1920. In September, 1923, Howell was appointed works accountant, and in 1937 became executive assistant to Spicer.

O. M. KELLY, former oil field plugging inspector, Osage Indian Agency, died May 30 at Gibsonburg, Ohio. Kelly retired from active service last year.

L. B. TAYLOR, Wichita, Kansas, former proration engineer, Gulf Oil Corporation, has been appointed petroleum engineer in the conservation division of the Kansas Corporation Commission, effective June 1.

WAYNE COFFMAN, engineer, Cities Service Oil Company, has been transferred from Bartlesville to Lyons, Kansas.

CARL TODD, geologist, Bishop Oil Company, has been transferred from San Francisco to Wichita, Kansas, as head of the land and geological departments.

BERNIE R. THOMPSON, with Halliburton Oil Well Cementing Company, has resigned to join Lone Star Cement Company with headquarters at Ardmore, Oklahoma. He will cover Southern Oklahoma, North Texas, North Louisiana and Arkansas.

First Oil Still Given To College Museum

Installation of the oldest petroleum refinery still in the Western Hemisphere as an exhibit in the museum of the School of Mineral Industries of Pennsylvania State College was marked by brief ceremonies at State College, Pennsylvania, recently.

Its invention by Samuel M. Kier in 1854 antedates by five years the more widely known accomplishment of Colonel Edwin L. Drake, who brought in the first well in the world drilled for oil. The still, which until recent months, has lain rusting and disused in the Salina, Pennsylvania, brick plant of General Refractories Company, which has presented it to the college, has been hailed as one of the earliest milestones in the development of a billion-dollar industry. Some authorities refer to Kier as the "grandfather of the American oil industry" and "the father of petroleum refining in the United States." The oil still is a memento to his inventive genius and enterprise.

Kier first came into contact with petroleum in 1842, when he found crude seeping from brine wells in Tarentum, where his father and he operated a salt manufacturing plant. A continually growing flow of crude was interfering with production of salt. By odor and sight it did not appear to greatly differ from petroleum which at that time was believed to be a panacea for all human ailments. Kier had a chemist analyze it and was informed it was identical with the medicinal substance, so he proceeded to market the by-product for its curative values.

Within three years the fluid was accumulating more rapidly than it could be sold, and Kier determined to see what other practical uses it might have. The still was built in an effort to refine the crude petroleum for use in illumination. It accomplished this purpose, but the illuminant was so odoriferous that it was objectionable for use within the home.

First Refinery in Pittsburgh

The first refinery was set up in Pittsburgh where it occupied a one-story building about 12 by 24 feet. It had a daily refining capacity of six barrels.

The still has suffered considerable disintegration through rust, the upper side walls being almost wholly eaten away. Dean Edward Steidle, of the School of Mineral Industries, plans to restore the apparatus as far as is possible with the aid of some old records. It is not likely that the upper restoration will be made from wrought iron, of which it was originally constructed, but from some transparent plastic material in show-case fashion. Other memorabilia about the inventor and the early days of the oil industry will then be exhibited within this shell.

Participating in the ceremonies last week were Joseph E. Moorhead, executive secretary of the Pennsylvania Grade Crude Oil Association, who was invited as a representative of the Pennsylvania oil refining industry; Dr. Sylvain J. Pirson, in charge of petroleum and natural gas engineering studies in the school; Professor C. W. Robinson, curator of the museum, and Dean Steidle.

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WORN OR DAMAGED
VALVES!

No valves "too far gone" for us to repair and put in shape to give you much more service.

You'll save money, too, because repairing prices are small and the value is again good as new.

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VALVE AND MACHINE WORKS
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1836 AIRLINE DRIVE - HOUSTON

Squeaks from the Bull Wheel

The Ultimate in "Roughing It"

Controlled by a thermostat, an electric warming plate has been invented to keep butter in refrigerators at the right spreading temperature.

For those intrepid souls who periodically "get away from it all, don't you know," and jovially tell how they enjoy "roughing it" (taking along everything but the plumbing), this little item is a "must" on the list of camp necessities.

Dual Purposes

A husband and wife were opening a joint account. Being in a hurry, the man made out his signature card and left.

"Let me see," an official said to the wife. "This is to be a joint account, is it not?"

"That's right. Deposit for him—checking for me."

Such Gallantry

"Dearest Annabelle," wrote a lovesick swain, "I could swim the mighty ocean for one glance from your lovely eyes. I could walk through a wall of flame for one touch of your little hand. I would leap the widest stream for a word from your warm lips.—As always, Your Own Oscar.

"P. S.—I'll be over to see you Sunday night, if it doesn't rain."

Very

"It is best for a girl to marry an economical man, you know."

"I dare say, mother. But its awfully trying to be engaged to one."

Wasms

The teacher had lectured on the various facets of communism, fascism and nazism. Then turning to the bright pupil, he said: "Johnny, what would you do with all these isms?"

"I'd make them all wasm!" came the prompt reply.

Point of View

"Do you believe that clothes make the man?"

"Well, a good suit has made many a lawyer."

Strategy

"How many chickens have you today?"

"Oh, about six, ma'am."

"Tough or tender?"

"Some are tough and some are tender."

"Well, I keep boarders. Pick out three of the toughest, please."

To this unusual request the delighted grocer complied at once, saying, "Please ma'am, here are the tough ones!"

Whereupon the customer coolly laid her hands on the others and said, "Then I'll take these."

Lost Balance

Doctor—Hurry, Nurse. We have an emergency patient in the operating room who lost his balance, and—

Nurse—Maybe he has one in some other bank.

His Error

The owner of a cheap watch brought the timepiece into the jeweler's shop to see what could be done for it. "The mistake I made, of course," he admitted, "was in dropping this watch."

"Well, I don't suppose you could help that," the jeweler remarked. "The mistake you made was picking it up."

Success

Do you consider that the First World War was a war of conquest?

Well, a lot of girls got husbands by it, didn't they?

Persistent

"Well, Nurse, how is the patient?"

"I gave him the figs you ordered, Doctor, but he keeps asking for dates."

Sign Reading

"Can you write?"

"Nope."

"Can you read?"

"Wa'al, I kin read figgers pretty well, but I don't do so good with writin'."

"How is that?"

"Wa'al, take these here signs along the road when I want to go somers; I kin read how fur, but not whurto."

Qualified

"Do you think Lucy will make Jim a good wife?"

"I don't know but she'll make him a good husband if she gets the chance."

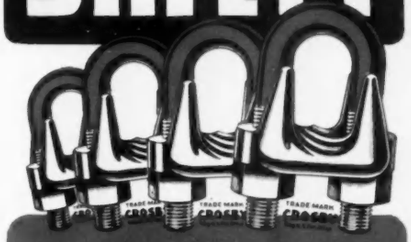
After the Quarrel

"Let's kiss and make up."

"O. K. with me."

She got the kiss and he the makeup.

SAFETY



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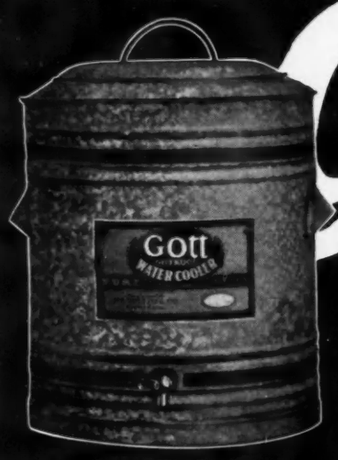
WATER CANS & COOLERS



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Made in 3, 5, 8, 10, and 20 gallon sizes.

GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . .

GOTT WATER CAN
Made in 1½, 3, 5, and 10 gallon sizes.

H. P. GOTT MFG. CO.

WINFIELD, KANSAS

KEEP PURE DRINKING WATER ALWAYS HANDY

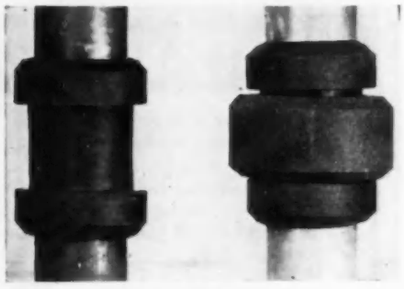
NOTES FOR THE Equipment Buyer and User

Drill-Pipe Bearing

E. M. SMITH COMPANY

A drill-pipe bearing, designated Grizzly Hug-Tite and designed for casing and open-hole drilling, has been announced by E. M. Smith Company, Los Angeles.

Made entirely of rubber, it consists of a solid-piece base shaped like a spool



E. M. Smith's Drill-Pipe Bearing, showing spool base at left and base with free-spinning rubber bearing at right.

with flanges at each end, and a free-spinning bearing to fit over the base between the flanges. The clearance between the bearing and the base, radially and endwise, is designed to permit the bearing to turn freely without friction, and is lubricated by the drilling mud.

In operation, the bearing stops turning when it comes in contact with the formation or casing, while the drill pipe and base continue to rotate. It is designed to serve as a positive roller bearing, eliminating torque and stress on the pipe and stabilizing the entire drilling string. Contact of the drill pipe with the formation or casing reduces wear on drill pipe, tool joints and casing.

The manufacturer recommends installation of a bearing on every second single throughout the full length of the drilling string to provide faster rotation and more weight on the bit without torque or strain, to lessen danger of twist-offs, to reduce wear and tear on machinery, to reduce fuel consumption, and to provide higher efficiencies and economies in drilling operations.

The base and bearing are hydraulically installed by special equipment.

Socket and Tool Set

BONNEY FORGE & TOOL WORKS

A light weight socket and tool set, Model TD6, has been added to the line of Bonney Forge & Tool Works, Allentown, Pennsylvania. Sockets and attachments included are all in ⅜-inch square drive, made of chrome-vanadium steel and heavily chrome plated to provide a rust-proof finish.

Containing 40 pieces, it includes 10 sockets with double hexagon openings from 5/16- to ⅞-inch; 4 sockets with ⅝-, 11/16, 13/16-, and ⅞-inch double hexagon openings; universal joint, 3-, 6-, 12- and 17-inch extensions; 17½-inch speeder; drag link socket; 8½-inch hinge handle; 6-inch cross handle, 7-inch reversible ratchet; 8-inch sliding T; 4 combination box and open end wrenches with 7/16-, ½-, 9/16- and ⅝-inch openings; Channellock adjustable pump plier with ½- to 1⅞-inch capacity; 4 assorted punches and chisels; pocket size screw driver with neon tube; four wood handle screw drivers of various sizes, and ¾ pound ball pein hammer.

All pieces are packed in a metal box measuring 19 x 5 x 4¼ inches. The box has removable tote tray, carrying handle, end catches and padlock hasp.

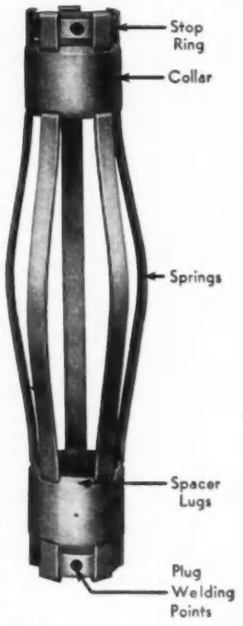
The entire set weighs 20½ pounds.

Casing Centralizer

BAKER OIL TOOLS, INC.

A centralizer designed to center casing in cased or open hole, designated Model B casing centralizer, has been announced by Baker Oil Tools, Inc., Vernon Station, Los Angeles.

The unit is constructed so springs are pulled through a restricted area to eliminate pushing that might tend to cause expansion at points where contraction is necessary. It is attached to the string by slipping it on the pipe, positioning it at the desired point and plug-welding two stop rings to the casing.



The centralizer consists of a number of springs, two collars and two stop rings. Collars are placed near ends of the springs to confine them at top and bottom and to maintain their circumferential position. Not attached to the collars, springs are made with an offset where they pass through the collars and are held in position by spacer lugs projecting from top and bottom of each collar, ends of the lugs being turned down to hold springs in place. Elongation of springs is limited by stop rings to give a specified compressed diameter to the centralizer when the collars contact stop rings. Ends of each spring are forged hooks which fit over the outer edges of the stop rings to give specified maximum diameter to the centralizer.

Only parts actually attached to the casing are stop rings welded to the pipe by plug welds at four points. Springs and collars are free to turn as a unit.

Design results in centralizer being pulled through other strings of casing by a stop ring, and not being pushed through. The pulling action permits centralizer to contract when going through a restriction instead of having to overcome a tendency to expand.

Recorder-Controller

C. J. TAGLIABUE MANUFACTURING COMPANY

Recorder-controllers of C. J. Tagliabue Manufacturing Company, Park & Nostrand Avenues, Brooklyn, New York, are now supplied with a tear-off feature consisting of a bar and a reroll

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You wouldn't use a "slim-hole" outfit to drill an important deep test . . . or use a 7/8" line for a 1¼" line job. Then why use instruments that are not capable of accurately controlling weight, speed, pressure and torque?
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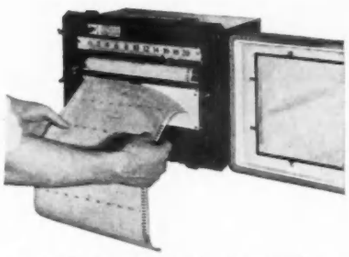

Tagliabue Recorder-Controller

with clip and tape. The clip is designed to firmly grip the chart after a section has been removed.

The feature permits filing of short chart strips for ready reference, and makes possible a chart record for a single day or a single batch or run. When daily records are required, a special chart can be obtained with hour markings, and with sufficient space to allow for resetting on correct time line.

Hose

THE B. F. GOODRICH COMPANY

Improvements in its high-pressure butane-propane hose have been announced by The B. F. Goodrich Company, Akron, Ohio.

The hose employs two hawser cord braids with a fabric backing over the tube to increase resistance to diffusion. Rated flexibility has been increased from three to five times with rated working pressure remaining at 300 pounds.

Tabulated Open Flow Capacities of Gas Wells

In an effort to determine the open flow capacities of gas wells and standardize the procedure for such calculations, as well as to provide a base in which the specific gravity, temperature and pressure of such open flow capacities may be ascertained, the Appalachian Geological Society has made available in new and amplified form the data shown in an earlier table prepared by the group.

The new table carries calculations for the various pipe sizes usually met in gas-well practice, eliminating the necessity for interpolation and recourse to the formula for sizes not shown in the original chart.

The table is available from the Appalachian Geological Society, Box 1435, Charleston, West Virginia, at 15 cents each in lots of less than 50, and at 10 cents each in larger quantities.

Boiler Tubes

The Babcock & Wilcox Tube Company, Beaver Falls, Pennsylvania, has issued Technical Data Card 114 listing information necessary to enter orders for bent replacement tubes for Stirling and other boilers made by the company. It is designed to provide prompt, time-saving shipment and correct filling of orders.

Diesel Power

Caterpillar Tractor Company, Peoria, Illinois, has issued a booklet on "What Users Say About Caterpillar Diesel Power," discussing problems solved by application of diesel power and portraying installations. It deals with installations in many fields, including oil pumping, drilling, refrigeration and heavy-duty hauling.

Schlumberger Electric Logging Patents Are Held Valid

A judgment upholding validity of Schlumberger Well Surveying Corporation's electric logging patents has been rendered by the United States District Court for the Southern District of Texas. The suit was known as Equity No. 792, with Schlumberger the plaintiff and Halliburton Oil Well Cementing Company the defendant.

Schlumberger complained that the defendant had infringed all of the claims under patent No. 1,819,923 and the first claim under patent No. 1,913,293. Halliburton denied that such patents were operable, alleged they were duly and legally applied for and issued, and denied infringement.

Judge T. M. Kennerly's judgment of 11 typewritten pages concluded:

". . . the applications for the patents involved in this suit and filed in the Patent Office on the dates set forth in the findings of fact were in accordance with and filed in accordance with Title 35, U.S.C.A., that the mechanism covered by such patents was new, novel and useful inventions patentable under such Title 35, and that both patents were when issued, have been since, and are now, valid under the law.

"I conclude that the various defenses interposed and pleaded herein by defendant are under the evidence in the case without merit.

"I conclude that the mechanism heretofore, and now being, manufactured, used, rented, etc., by defendant infringes those claims in plaintiff's patents which are involved in this suit.

"I conclude that plaintiff is entitled to judgment against defendant, restraining further infringement, and for damages for past infringement to be hereafter ascertained by appropriate proceedings."

Canadian Lincoln Electric Completes New Building

Canadian Lincoln Electric Company has completed a new plant at Leaside, Ontario. The unit was constructed by fabrication of structural steel at the job site, eliminating delays induced by priority war orders.

The building has exterior dimensions of 302 x 100 feet, with general offices in a space 40 feet wide extending the full width of the building across the front. There are eight bays of monitor-type roof with end bays of flat-roof construction. As many windows as possible were set in all walls, and continuous glazed sash on inclined portions of the raised roof.

Iverson Tool Named Bucyrus-Erie Distributor

Iverson Tool Company, Tulsa, has been appointed by Bucyrus-Erie Company, South Milwaukee, Wisconsin, as distributor for drilling equipment for the West Texas and New Mexico territory. This company has stores and shops at Artesia, New Mexico and Wink, Texas, and a store at Odessa, Texas.

Industrial Tractor & Equipment Company, Baton Rouge, has been appointed Louisiana distributor for shovels, draglines, clamshell and lifting cranes. The territory covers the state except for parishes around New Orleans.

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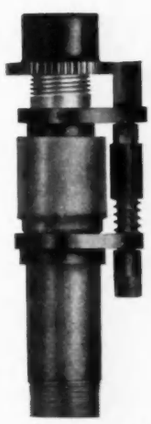

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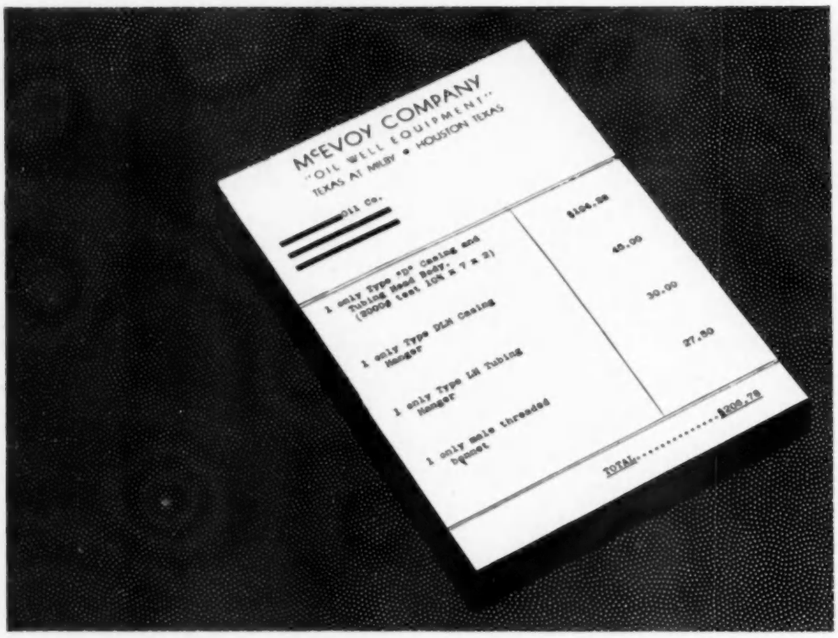

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